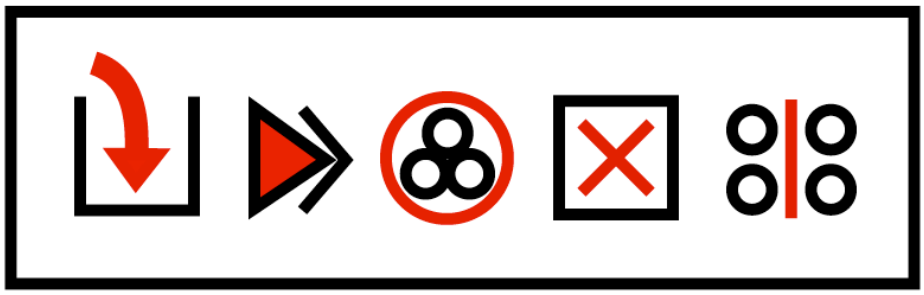

INFORMAL ARCHIVING SYSTEMS FOR DIGITAL VIDEOS.
A proposal for design principles

Master's Thesis
Media Lab
University of Art and Design UIAH

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ABSTRACT

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Abstract

This thesis deals with the challenges of archiving and organizing digital media, in particular video, as part of everyday life.

Through mapping of related research work, products and phenomena, the current paradigms of development in media archiving and organizing are identified. By means of a documented, exploratory field study into the homes and physical video collections of six individuals, it is observed that people organize and archive their physical media archive primarily through placing videos in environments and locations with specific functions and secondly, through reorganizing the media when they use it. These observations are refined and translated by producing six video prototypes which present speculative situations of archiving and organizing videos amidst daily media usage.

As an outcome of the knowledge and understanding created in this design research project, the practice of informal archiving is identified. The differences between the informal and formal, professional way of archiving are presented. A set of design principles for developing systems that take into account the needs, context and practices of informal archiving, are proposed. A possible application of using the principles is illustrated in the form of a scenario.

Materials
Thesis, catalog and a DVD

Keywords
Design research, informal archiving, personal media, digital preservation, everyday life, contextual design, practices, video prototyping, field research, scenarios

Where deposited	Confidential until
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Figures 2, 3, 7, 18 & 22. Project Timelines. Tiina Merikoski
Figure 4. YouTube user-interface. YouTube, Inc.
Figure 5. Nokia LifeBlog concept image. Oy Nokia Ab
Figure 6. iTunes user-interface. Apple Computer, Inc.
Figure 15. Video prototype. Bossen et al. (2005)
Figure 19. Different archival systems. Tiina Merikoski.
Figure 22. Logics of consumption, production, distribution and archiving. Tiina Merikoski.

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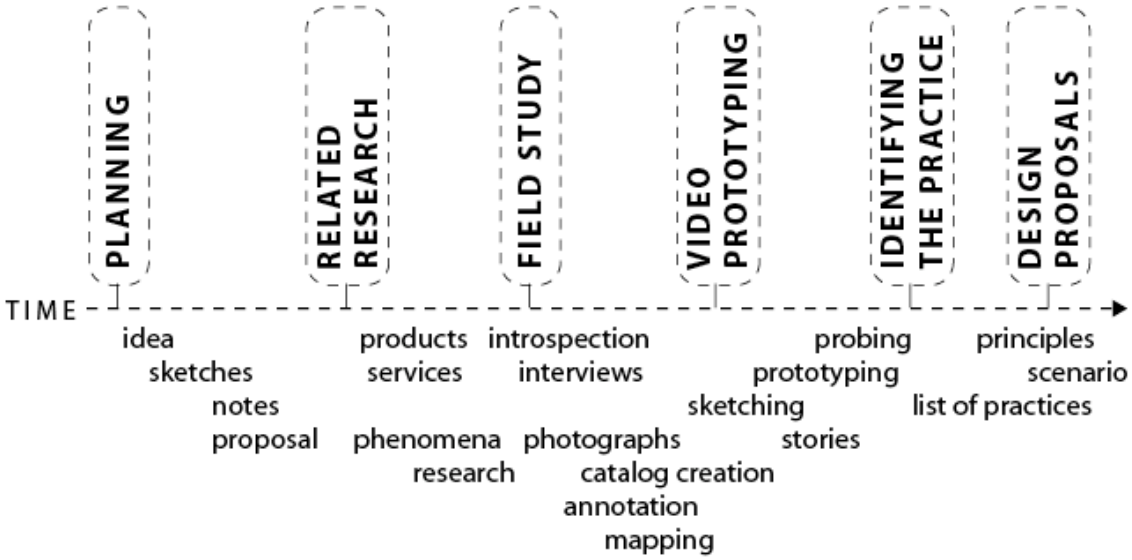
… Tiina with love and illustrations, inspiration and book-making!

Ville Tikkanen

TIMELINE OF THE PROJECT



1. INTRODUCTION

In the past years there has been a massive increase in the amount of media activity, media tools and technologies. More people have started to document and mediate parts of their everyday lives using text, digital photos and videos. A lot of effort has been put into developing novel tools, services and platforms for consumption, production and distribution of media in this new context of everyday life. However there seems to be a lack of understanding what people are doing with these technologies in everyday life and what are the implications of these actions.

This thesis looks at one particular manifestation of this development: the personal use and archiving of video. Affordable and quality-wise decent video capture devices have emerged in the form of digital still cameras, web cameras and camera phones. The diffusion of consumer broadband into middle-class homes has turned the Internet into a distribution platform for video content in the form of peer-to-peer (P2P) file-sharing and video-sharing services such as YouTube. Hubs of home entertainment, for example, digital TV set-top boxes and multimedia PCs have started to establish their position in the everyday consumption of audiovisual media. Portable and connected display devices have started to emerge in the form of cell phones, iPod Videos and portable game consoles. People produce and possess more media and as a consequence they also need to store it somewhere.

Growing collections of digital media now exist in the hands of common people in ways which they have never existed before. Media production, consumption and distribution tools have been integrated into everyday lives of people, but their everyday archiving solutions cannot support these tools sufficiently. The increasing *flows* of audiovisual media, that are created through use of the media technology, is only one side of the story. The other side resides in the handling, managing, preserving and dealing with the media. It could be said that on the whole there is a problem in archiving and preserving one's personal digital data.

One clear voice of concern is raised by Beagrie (2005) who calls for development that will explore the challenges people face with the long-term preservation of their digital data. The surprising cumulating personal media archives of digital media and the challenges of dealing with them seems to have also caught by surprise the developers of technology as they are now developing new ideas for software applications (Gemmell et. al 2006) or personal media archiving services (Marshall et. al 2006) for dealing with people's media.

This thesis builds on the above arguments and contends that the rich context, needs and practices of people archiving and keeping media in their everyday life are not fully understood by the developers of consumer products. A simple example of this is the difficulty to conveniently create backups of text messages on a basic mobile phone. Originally the developers created text messaging only for network testing purposes. As it was not anticipated that people would communicate with it in everyday life, only very cumbersome facilities for archiving or organizing the messages was provided. The fact is that some people wanted to archive, keep and store the important messages they have in a more permanent and trusted storage environment than a mobile phone. Yet there are still no common, feasible solutions for this and the increasing variety of personal media used in mobile phones is starting to make the situation even more complicated.

1.1. Personal digital archives

Currently there are only a few documented, observational user studies (f.ex. Marshall 2006 and Marshall et. al 2006) of the challenging situations of people trying to cope with the masses of

cumulating personal digital material. The above-referred studies report, in my interpretation, a certain degree of frustration, distrust of technology and indifference towards the certainty to be able to preserve and maintain important, personal digital media over a longer period of time.

Beagrie (2005) has claimed that "[a]s digital content in personal collections continues to grow, particularly content that has been paid for such as digital music or video, it seems likely that individual and public consciousness of and concerns over *digital continuity* will also increase." By digital continuity, is meant the ability and competence to create a collection of digital material and preserve, maintain and migrate it over generations of hardware and software technologies, products, data formats, brands, physical locations, storage environments and ultimately, people. (Beagrie 2005)

From the perspective of archiving and preserving this uncertainty and the unsustainable development leads to the inability and unwillingness to make wise strategic and committed consumption decisions in the case of preserving personal digital media material in the long term (more than five years). It seems that the only way these new technologies of media production, reproduction, consumption and distribution can exist, and be introduced into use in everyday life, is the continuous increase in storage capacity and data transfer speeds. They make possible forgetting and not dealing with the needs to organize and archive media.

Figure 1. Personal media use in different contexts which overlap in personal digital collections in Beagrie (2005). It is easy to acknowledge the challenges encountered when using media in different contexts and moving across these boundaries.

It is obvious that for the tools and technologies for producing, consuming and distributing digital media to be necessary and useful, there must be an immense variety and diversity[1] of digital media items existing to be utilized by people on a daily basis in many different contexts (Fig. 1). For the media to be usable and accessible in a convenient way and for the production, consumption and distribution tools to have a reason for their existence, the current developments should be complemented with *developments on archiving and preservation of digital media in everyday life, as opposed to focusing only on producing, sharing and consuming media in everyday life.* Through this focus, a new understanding, and a radically different, sustainable development strategy for digital media products can be achieved. In my opinion the

[1] Kommonen (2004) has presented a set of potentials which the media environment can move towards in a *converged* technology and media environment. The potentials describe certain eco-systemic characteristics of media, which can be observed in individual, particular media items. Diversity in the types of media, is one of them.

difficulties and challenges regarding this everyday, informal archiving is not only a troublesome sign, but also a design opportunity.

1.2. Goals and scope

The two main goals of my thesis are:

1. *To identify and describe the practice of informal archiving of personal audiovisual media and its contexts. This is based on the understanding created by literature review, by conducting a sample field study, and a conceptual design process with light-weight user participation.*

   To reach this goal I have experimented with various ways to inform myself about the context of design and to communicate the design proposals in ways which are familiar to me. As a byproduct I present **an approach for documenting field studies** that rely on writing, photographs and map visualizations to generate a strategic understanding of a person's video collection and it's different contexts (Appendix A - Catalogue). To be able to work with the complex topic and to communicate it to the participants of the design process, I developed **a light-weight video production approach** for the purposes of video prototyping and sketching in interaction design (Appendix B - DVD).

2. *To propose a set of design principles which can be used to drive and inform the design and development of archival systems and archival features for digital video.*

   As this is a *design research* project, my aim is to work as much as possible to produce particular design artifacts to transfer my understanding. The result of this approach is a set of **design principles,** and **a scenario** presented in chapter five.

My written thesis work describes the artifacts produced during the project, and how they were used in the process. The primary method of knowledge production has been to practice design and to communicate this in a language in which people involved in design projects can understand. The creation of the video prototypes was convenient as I have a background in audiovisual media production. Based on this understanding, I have also made a few observations of the professional media's way of working and how some issues should be thought differently in its everyday context.

1.3. Context of my thesis work

My thesis work has been done in three contexts. It is important that these contexts are made visible, so that the reader can understand the motivation, as well as the environment in which it has been done.

Firstly, this thesis has been done in partial fulfillment of the Masters of Arts degree in New Media at the Media Lab, Helsinki.

> *"The mission of the Media Lab is to **explore, discover and comprehend** the new digital technology and its impact in society; to **find and exploit** the possibilities it opens to communication, interaction and expression and to **evaluate, understand and deal** with the **challenges** it poses to design and creative production."*
>
> *(excerpt from Media Lab Helsinki web site, 11.2.2006, emphasis mine)*

Secondly, the environment in which the work has been done is the Arki Research Group, a multidisciplinary research group inside the Media Lab, Helsinki. Arki is an ongoing research effort

in the Media Lab, preceded by Future Media Home and Design Fiction projects, to study digitalization and convergence of technologies and media from the point of view of peoples everyday life.

> *" […] How will our **everyday life** be **transformed** with all the digital devices, networks and software that are invading our activities and environments? Is this **development** programmed by **others** or do **we** have ways to **influence** it? These questions motivate our work.*
>
> *The two main research and development directions of Arki are:*
>
> - *to **find ways** to **enable** more people to take advantage of the **digital development** and to **design their own lives** with digital tools, and*
> - *to study the **evolution** of the **media environment** and **design** new interesting media **formats** and **tools**"*
>
> *(written description of the group to a festival catalog, 30.8.2006, emphasis mine)*

Thirdly, within the research group, my thesis work has been included as a part of the Mediaspaces project. It is a research project, which is funded by the National Technology Agency of Finland (TEKES). Industrial partners of the project are Nokia, Helsingin Sanomat and Digita. The project is a 3-year research project, which started in the beginning of 2003 and concludes in November of 2006. I have been a part of this research group since Spring of 2005.

> *"The basic premise of the Mediaspaces initiative is that the convergence of media is creating a **new environment technologically, economically, and culturally**, that requires **new development of competences, processes, tools and products in all fields of society** — technological developments are not enough for success."*
>
> *(excerpt from Mediaspaces web site, 11.2.2006, emphasis mine)*

From these three excerpts it is seen that the key element in all of these is *change* - in culture and media, society and communities, technological applications and especially, in the personal lives of people. In this thesis, the change that take place is the increase of the availability of digital videos and the practices of how to deal with the constant increase in numbers and differentiating contexts of use.

1.4. Thesis structure

Fig. 2. represents the main phases of my project. The structure of this thesis follows the structure, but excludes the planning and the very early idea formation.

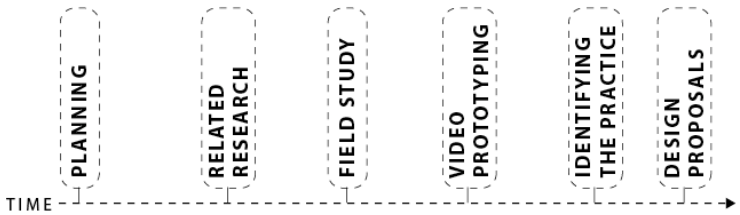


Figure 2. Timeline of the project

The work and the results of my project are presented in the following order:

Chapter 1 introduces the topic of this thesis and describes the goals of my thesis work.

Chapter 2 is an overview of the related phenomena and research work that provides insight to the subject matter.

Chapter 3 presents exploratory design issues which consists of a field study and video prototyping. It aims to present the design process in an in-depth view, such as the materials and methods used.

Chapter 4 presents and identifies the practice of informal archiving of digital media. It also presents the challenges in question of digital video and video use.

Chapter 5 presents the final results of the design process: a set of design principles and a scenario to further explain how the given principles can be applied in a concept application.

Chapter 6 concludes and summarizes this project and examines and reflects upon the results of the project. It also provides thoughts on how to further pursue the same subject matter.

2. RELATED PHENOMENA AND RESEARCH

This project started when I wrote a project proposal for the Mediaspaces project. It described a field study and a conceptual design project, which in the paper was to present a concept of a personal audiovisual media archiving system. This was naturally a loose description of the final result, which was expected to be focusing when the project proceeded further. To bring it the needed focus, an extensive examination of related research work, products and phenomena was done next (Fig. 3).

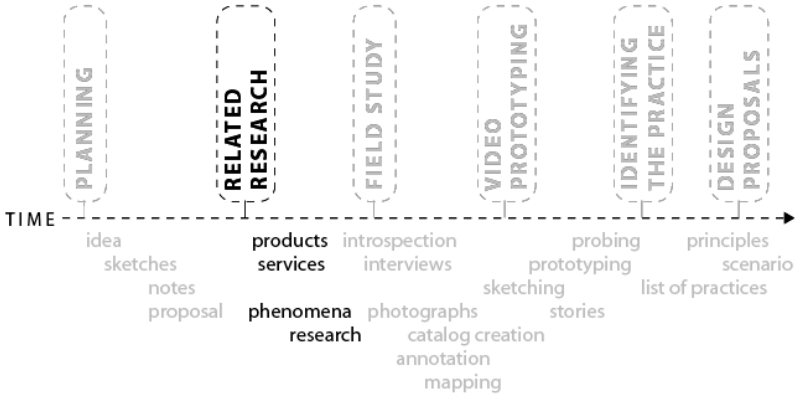


Figure 3. Timeline of the project

As mentioned, development efforts in the field of digital video archiving have many institutional stakeholders, who drive the development of technology and its intended uses. For example, video producers are interested in the development of their production systems and pipelines. Distributors' and broadcasters' focus is on solutions for commercial video distribution, and developing new business areas or reinforcing old ones using new technologies. Archives and libraries are interested in the technologies for preservation and archiving - in the professional meaning of the word. Video camera and cell phone manufacturers focus on the usefulness and frictionlessness of the production tools and sharing applications establishing the material to flow as easily as possible. And the manufacturers of set-top-boxes, media center applications for PCs, and related media consumption environments focus on how to make their device or solution the one which is used by all the consumers to consume media (and in some cases organize and archive it).

As this is the full spectrum of development at the moment, there is an obvious, human-sized gap in the middle. How could people themselves manage, preserve and organize the digital media, which they use daily? This need extends over device and application boundaries, from commercial products to "home videos", and from work to home context. In this light, it is useful to look at the research and development efforts happening in related important contexts, and try to identify the boundaries and limitations of these developments, when looking at the development with a human in the center.

2.1. Role of metadata in personal media production

Most tools for media production, as well as the tradition of media asset management, originate from within the media industry. In professional audiovisual media production organizations, an employee is often assigned the role of 'continuity', or 'script supervisor'. This person's job is *during the shooting* to create a rich contextual information log, a production diary, for the otherwise meaningless, physical segments of audiovisual media. The production diary contains information such as *what is visible in the picture, what happened in the picture, who were in the*

picture, what is the framing size, is the take ok or failure for some reason, etc. In the industry context, this information has two main purposes:

1. To monitor and assist production of *continuity* in audiovisual narration during shooting, and

2. To communicate with the people working in post-production, i.e. the editing and sound design process.

As my focus is not on creating the next box office hit, I am primarily interested in the second function. The continuity notes, which are annotated with the time-code of the recorded material, support the selection of the video material in the post-production process and ease communication over the clips. In a sense, the production diary is a way of creating archival information during production. This kind of continuity information is at the moment missing from the context of *everyday*, personal media production. However, technological developments with similar aims of creating production metadata that can be used to organize media in a later stage are starting to emerge.

When recording video in informal contexts, for example using a cell phone camera, one could, if given appropriate tools, also add manually contextual metadata to the video. Such metadata could describe *who* appears in the clip, *where* and *when* the recording took place and *what* the occasion was. Sarvas (2005) has researched the adding of user-centric metadata in the case of digital photos taken with a camera phone. The results of these field studies indicate that contextual data should be created as a side-product of some user *activity.* Both Sarvas (2005) and Rajanti et. al (2006) found that people find it too cumbersome and complicated to manually add descriptive or categorical metadata to a photo.[2] The users' in these studies focused on accomplishing the task at hand, and use the media in the way they wanted, but nothing more. This is probably also the case with video.

Merkitys-Meaning (2006) is an application for mobile phones, which creates rich contextual metadata for photos using *sensor data* to acquire information about the location of the phone using GPS. In addition, the application uses BlueTooth to sense nearby devices to pick up who is nearby. This information can be used to organize photos based on *location information.* All this can be naturally applied to video as well. Obviously, for the contextual metadata to be useful, it has to be maintained and preserved intact: it must survive migration between digital storage devices, between operating environments and between different applications or services. This means that standards will need to be developed and agreed upon, so that compatible technologies can be implemented and manufactured.

The EVERPLAY specification is the first initiative in this direction, developed by the manufacturers of digital photo equipment. EVERPLAY has *"defined the rules for preserving photographic images and associated metadata, so that they can be reproduced and enjoyed even through the transition to future storage media and technologies."* (Everplay 2006) The authors say that the aim of EVERPLAY is to future-proof personal image collection data. In the media industry, there have been efforts to standardize metadata (such as MXF for transferring productions between organizations, and the general purpose MPEG-7 standard). EVERPLAY

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[2] The difficulty and cognitive load of categorizing things, and naming them has been documented in relation to information systems already in Malone (1983), and since that in many studies. For some reason the ideals that originated in the context of the workplace and professional use, of using a file system and folders, controlled vocabularies and taxonomies for organizing media content, still prevail.

presents the first attempt at standardizing media metadata in consumer technologies and it also supports video.

2.2. Infrastructures for video sharing and social media

Digital video files are shared in a variety of ways: on USB memory sticks or other forms of portable media storage, as attachments to e-mail or instant messaging, by uploads to YouTube or Google Video, on web servers or through peer-2-peer (P2P) networks.

There has recently been a focus on creating specialized products, product features and services for media sharing. Examples range from the previously mentioned YouTube[3] and Google Video[4], over web-based collaborative editing applications like JumpCut[5] and Eyespot[6], to product features of Apple's iTunes which allow streaming of audiovisual media on a local area network (LAN).

In the research and design context, Tazaki (2005) presents InstantShareCam, a conceptual design of a video camera with the ability to share and collaboratively edit videos over a wireless network connection. The focus is *not on preserving* media but on social exchanges and transactions, supporting communication and comprehending the audiovisual media artifacts as social products. Another example, Family Scrapbook (Chelaru 2005), is a desktop photo sharing application concept which allows a family to share photos, thereby creating a family archive of digital photos. This family archive is created as a side-product, not the primary product, of the sharing activity.

Figure 4. The actual video player is only a part of YouTube.
Most of the features are for social interaction or media organization.

YouTube and Google Video are commercial services, which build their model on offering free storage for videos and rich possibilities to describe them and organize them together. In fact, most of the focus on the site is on the social media features, as can be seen in Figure 6. The sharing of videos on these centralized services has created a huge archive of audiovisual media, available openly on the internet. However, sharing and storing media in the public, even if it

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[3] http://www.youtube.com/
[4] http://video.google.com/
[5] http://www.jumpcut.com/
[6] http://www.eyespot.com/

could be considered “hidden in public”, has its limitations: very private and intimate media sharing cannot take place through a public service, unless the user wants to expose herself to the world (Engeström 2003).

In the Arki research group, in which this thesis has been produced, many projects deal with media sharing and social media. The Encompas project[7] developed Kori, a web-based photo-sharing application prototype for communities and groups, which allows users to collect digital photos in one place and comment and organize them collaboratively. The Mediaspaces project[8], in which I have also been working, has been building prototypes of applications for collaborative, web-based video processing and social enrichment. Lagomarsino (2004) presents Kitchen Album, a conceptual design for a video and audio-based cooking recipe sharing and archiving system. Its focus is to enable geographically distant family members to share cooking moments, and at the same time archive them to remember these shared moments. Greetings from Linz, was a demonstration of a simple web-based video-sharing and collaborative editing application, aimed at collaboratively organizing and editing the video material produced with a set of six camera phones during the Ars Electronica 2006 festival.

All the aforementioned projects are realized using the centralized server architecture. The Arki research group also hosts a project called P2P-Fusion[9], which investigates the feasibility of distributed media storage through a platform, which would allow individual users to host media sharing services and applications in a distributed network (P2P-Fusion 2006). This type of ‘self-hosting’ might reduce the importance of archives on centralized servers, over which ordinary users exert very little control.

2.3. Applications for personal media and video archiving

When talking about archiving personal digital videos, a very limited number of products are available for users. In fact, most of the archiving takes place on the level of the operating system. Exceptions to this rule are the LifeBlog applications by Nokia; some media players that, like iTunes, have features for archiving and organization; photo manager applications with video support, such as Picasa[10] and Apple iPhoto[11]; and the web-based video sharing services that were described in chapter 2.2.

Nokia’s LifeBlog (Nokia 2005) is a set of applications which archives and indexes the media created on a particular phone, sorted by time. It consists of an application on the cell phone, for organizing media files, and a PC application connecting to the place where the media is eventually transferred (Fig. 5.). In both environments the concept builds heavily on the idea of sorting the media based on time. However, the simple affordance of being able to easily transfer the media and the metadata to your own computer with the same framework used for organizing the media is a big step forward. However, this is to date the only example of its kind.

LifeBlog does not attempt to facilitate arbitrary categorization of media objects. It positions every media item on the same timeline - making the media produced with the phone a chronology of historical, autobiographical events. This organization schema is built on the data generated from *using the phone*. Despite the fact that this organization makes sense, the current application is

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[7] http://www.encompas.org/
[8] http://arki.uiah.fi/mediaspaces/
[9] http://www.p2p-fusion.org/
[10] http://picasa.google.com/
[11] http://www.apple.com/ilife/iphoto/

too simplistic and makes too many assumptions about users' needs. Apart from the timeline, it does not offer any other ways for filtering or organizing the data. This makes it too unsophisticated to support any sophisticated media organizing practices.

Figure 5. The Nokia LifeBlog application consists of an application for the mobile phone and a PC application. In the application the media is organized using a timeline.

Fig. 6. shows us the assumptions underlying iTunes' classification and describtions of audiovisual media. First of all, the metadata is mainly based on the descriptive categories of a popular music song: It is produced by an "artist", it has a unique name or title, it might be part of an album and it has values like beats per minute (not shown in Fig. 6). The clash of institutions continues when opening the video tab: there are no other categories than a movie, a music video and a TV show. If it is part of a "show", it has a season number, an episode ID and episode number. iTunes has been expanded to include video, but does not provide any proper tools for organizing and managing them.

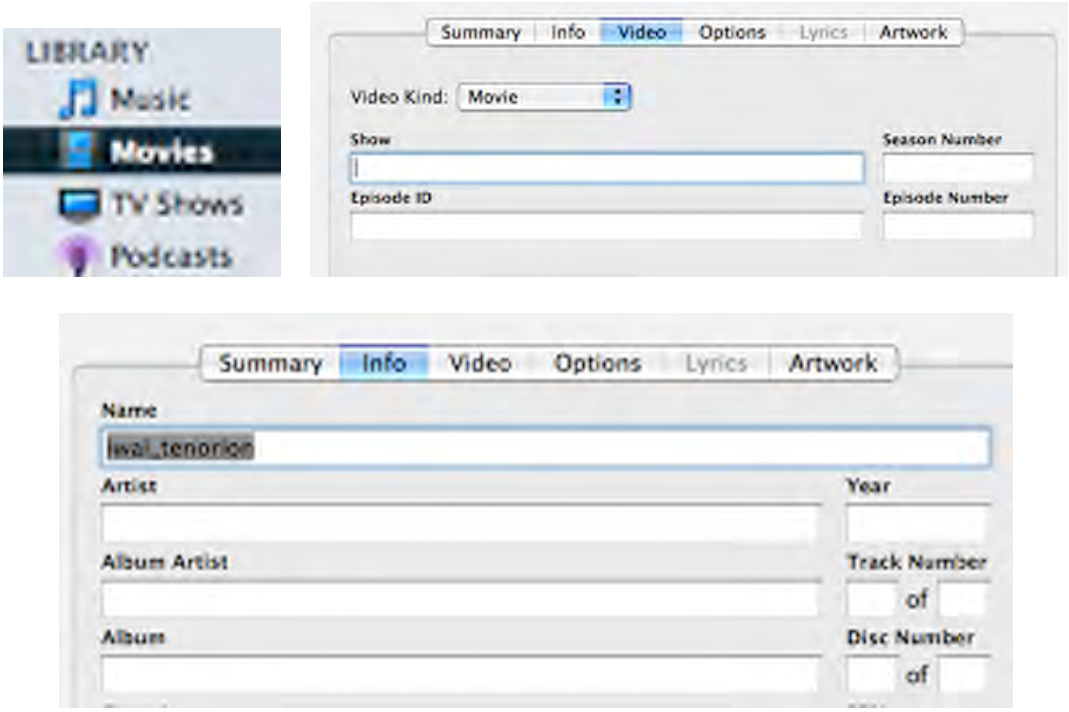

Figure 6. Partial screenshots from the iTunes metadata input forms and library interface.

This metadata schema follows from iTunes being a channel for distributing media content from the Apple Store to consumers. To be able to maintain the offered collection a sophisticated, domain-specific classification scheme is used. This scheme helps the users find music and videos which they may want to buy, but that's also where the offering ends. It only serves the archiving needs of Apple and the music industry, and acts as an infrastructure that supports the movement of musical works.

A more freeform, informal way of organizing media, based on "tagging", is found on video sharing services like YouTube and Google. These services allow users to tag media files with one or multiple keywords, which can be used to filter searches of the media database. Clay Shirky (2003) has described the usefulness of such collaborative tagging of media for situations where non-experts are the ones doing the classification of content and where the uses and genres of the media vary.

In the opposite case, that of a formal categorical classification system, Shirky identifies the need for close co-ordination amongst those who classify the content. Bowker and Star (1994) have attempted to make visible the creation, development and maintenance of formal naming and classification systems. From reading their study it can be concluded that formal classification cannot possibly be the primary way of organizing media in everyday life, because of the large work-load needed to maintain, monitor and develop such a classification system.

The ethnographic study by Marshall et. al (2006) focused on user research for creating a service for personal data and media archiving. When translating the research results into design implications, they asked from the point-of-view of a professional information expert: What are the everyday information archiving practices of people? And what could a professional service additionally provide to support, for example, long-term preservation and future-proofing of digital data? This approach might provide a solution to the challenge of preserving personal data. However, it is certain that there will be and should be different competitors offering such storage.

This work focuses on those critical, mundane parts which in the future will still be done by people themselves.

2.4. User interface metaphors for organizing media

Regarding user-interfaces of systems for digital video archiving, one must be aware of the system and user interface metaphors being used, and of how that metaphor and the functionality which it provides fit to the practices of everyday life. Metaphors are powerful ways in which to communicate the system's underlying features to the user. It has been argued that a primary design challenge is to find good, clear and powerful metaphors that make sense to the user and that may also be used to describe and develop system functionality (Erickson 1990). Others have argued that emphasis should be placed not be so much the metaphor, but rather the conceptual model of the application (Winograd 1996).

The metaphor and conceptual model of the file system and the hierarchical files and folder structures, are pervasive in all present-day computer user interfaces. The file system has been criticized for dividing the work of organizing information badly between the user and the computer (Raskin 2002). The file system's graphical equivalent, the desktop metaphor, is the *de facto* standard of user-interfaces. It has been criticized for poorly representing what is actually happening inside the computer, adding a layer of abstraction but at the same time attempting to represent everything on the display.[12] Recently, the graphical desktop has been subject to criticism because of the difficulties of coping with the increase in media content. In recent years' research on user interface and system metaphors, there have been two directions of development which are relevant to this study: classification-based user-interfaces and time-based user-interfaces.

The main form of media management applications is a genre of software, which are called 'type managers' (Meyer 2005). Type managers are specialized data management applications which deploy powerful, multidimensional, faceted metadata schemes to organize and classify the information in question. In applications, which can make use of faceted classification, metadata is interesting because it can usually be customized to be more flexible. What is interesting in type managers, is the way they represent data in a *column view*. This view, which offers a large amount of possibilities to organize the media, can be described as an evolution of the spreadsheet view.

Mander et al. (1992) present a UI metaphor called Piles. Developed at Apple Computer, it was aimed to provide more flexible ways of organizing documents, ie. files, in a graphical user interface. The concept was based on a field study which focused on how people dealt with the flow of information in the real-world office space, and showed how office workers often used document piles to complement folders. However, the Piles metaphor was never implemented in any release of Mac OS.[13]

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[12] As computers were first developed to be used in the office, the metaphor of a file system was natural: files were given names, preferably after some shared or given naming practices, files were organized in folders, and useless data was put into the shredder. When home computers were introduced, the file system and it's graphical representation was the way in which data was organized and it has since been put to use outside the work-place as well.

[13] My interpretation of why we don't see Piles is that Apple's researchers understood that grouping documents was important, but they developed ways in which to create representations of document

The other direction in user-interface development has been to move towards time-based navigation of content. This has been successfully implemented in Google Picasa and Nokia LifeBlog. In Picasa and Lifeblog, the user moves on a timeline back and forth, relying more on autobiographical memory than sophisticated or not-so-sophisticated classification-driven attempts. Autobiographical memory means that the user recalls the events and actions she makes. One of the early examples is Lifestreams by Fertig et. al (1996), which uses a three-dimensional timeline to represent a user's history of document use. Rekimoto (1999) takes the time-based organization of information even further through introducing a prototype of a desktop, which stores a snapshot of a day's activity on the desktop. The user can scroll through the calendar, and find the documents that were on the desktop at a specific time.

Microsoft's MyLifeBits (2004), inspired by Vannevar Bush' vision of the memex, an information environment for the scientist to record his daily activities and experiments using rich media, and share this information with other scientists working in other labs around the world (Bush 1945), represents the keep-it-all approach of storing every encountered media into a cumulative database. Also called "a life-time storage", MyLifeBits focuses on the idea that people cannot make the decision whether to keep the material on creation or use, so it is better to store everything by default. [14] After storing this hybrid collection of a variety of data in the *personal data store* – the files can be interconnected, accessed and combined in a variety of ways, thus making more sense of the media.

2.5. Summary

It seems that many of the studies, products and services which focus on the realm of everyday life and media use, are abandoning the categorical classification system. This observation has led me to believe that people don't always (and should not be forced to) project any special meaning to the media they use or create. If they have developed a sophisticated practice of using a classification and naming system of their own, they might use it to describe the media content. However, the observations made from field trials by Rajanti et. al (2005) and Sarvas (2005) lead me to believe, that in fact categorization, tagging and classification are needed when media is moved across institutions or to other social contexts: from the personal sphere to the realm of a community.

It seems that in personal use, the more convenient ways to organize media are those which support and utilize autobiographical and spatial memory: time, place and other contextual information created in events of media use, production, consumption and sharing applications. This is difficult to prove yet, as there are still only few products and development efforts visible.

Also, it seems that the success of social media applications for audiovisual media like YouTube and Google Video are successful not only because they provide a convenient storage for sharing media, but also because they enable the collaborative organizing of media content through collaborative classification, different mechanisms for grouping and social processing. These help to engage people in the process of organizing the archive simply through using it and being a part of the community.

---

groups to the user-interface. Instead they should have focused on the act of grouping documents, creating affinities and relationships as well as working with those ideas without any visual metaphor.

[14] Jones (2004) asserts that the strategy of 'preserving everything' is something, which the human attention cannot handle, and propagates an approach to develop technology which would minimize "keeping mistakes" of digital data.

3. DESIGN EXPLORATION

In the process I have worked with a variety of methods, aiming to obtain information about the context of the design. As this is a *design research* project, my aim has been to work as much as possible through producing particular design artifacts, in order to transfer my understandings to other designers. After the review of related work, I started a design exploration with two conjunctive parts (Fig. 7)

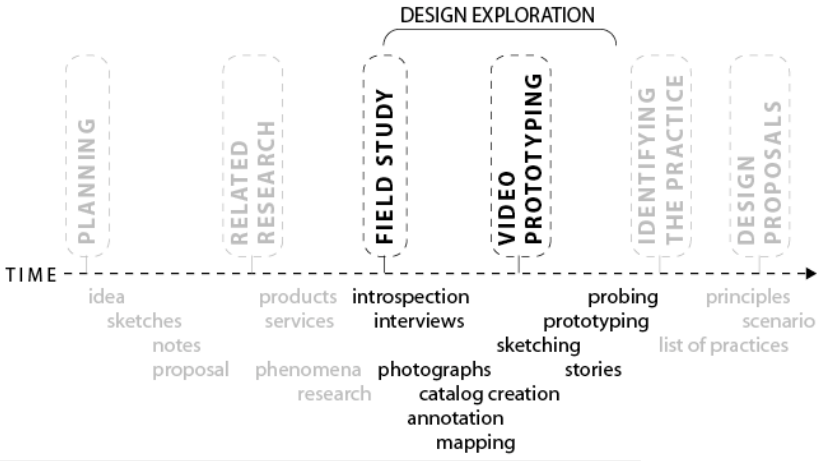

Figure 7. Timeline of the project

The field research on how and in what circumstances people archive audiovisual media and why, gave the direction during the whole process and made it focus eventually on the practice of archiving rather than on the technologies. In the very beginning of the project, I did an extensive research and phenomena mapping of topics related to my project. The results and observations from that research are also presented in-depth in chapter 2.

3.1. Field study

Based on the mapping of the related work, I set out to find a way in which to engage with the reality. It seemed that many of the artifacts and research I studied dealt with institutional archiving, explicitly or implicitly. These apparently came either from preservationists warning people about the challenges of digital preservation, from technologists promoting their views, from the media industry or from information scientists developing sophisticated technologies for classifying institutional media collections. It seemed that individuals or families were not considered to be significant. I decided to engage with the actual topic of research and try to get to the same level and see how an individual in fact deals with preserving media, in this case video. My approach followed very much the approach of *contextual inquiry.*

Contextual design, as described by Beyer and Holtzblatt (1995), contains a process called contextual inquiry, which borrows heavily from the practice of ethnographic research. Despite its origins, contextual inquiry should not be mistaken for ethnographic studies, as it is more of a light-weight set of field research methods tailored to the needs of designers. Contextual inquiry aims at engaging designers with the context and environment which the software is being designed into. In practice this means observing and engaging with the context of the future product, with an attempt to comprehend the conditions, practices and social issues that surround the object of design (Beyer, Holtzblatt 1995).

Application of ethnography-influenced field research methods and approaches in design projects has also been a subject of criticism. The main criticism has come from anthropologists who criticize the expectation that ethnographic research should provide “design ideas” for

design projects. Suchman (2002) makes an analogy between the accounts required by colonialists from anthropologists about the cultural structures of the colonized countries and the accounts required by industrial corporations of the lives and practices of their users, customers and consumers. Like Suchman, Dourish (2006) argues against forcing ethnographic research and researchers to provide implications for design in development projects. He argues that ethnographic research as such, can not and should not provide implications for design. Ethnographic research is valuable in and of itself, as it provides insight on the arrangements and structures of the socio-material reality (Dourish 2006). By choosing to call my field work contextual inquiry, I aim to make visible the opportunistic nature and motivations for my field work and also my discipline.

3.1.1. Observations through introspection

I began planning the field study with a small exercise in introspection. I started with observing my own home surroundings and my own activity inside the frame of the research: how I handled video, how I made sense of my video collection and how the collection was structured. I had to make a big effort to get rid of my biases as a video professional and non-graduate designer. Reflecting back to the very beginning, it was extremely hard to see the ways in which media are organized in the context of everyday life. In fact, it turned out later that I had been asking the wrong research question - instead of *what* and *how* is a video collection, I should've asked *when* is a collection.[15]

Jane Fulton Suri (2005) talks about how contextual studies can be used to *invite curiosity* in designers on engaging with the most tacit dimensions of human behavior. Emphasizing the engagement and not knowledge creation or transfer, was a natural way to work.

Figure 8. Pictures from the introspection.

I started writing lists of my practices using pen and paper. I tried to list what I did to my videos and drew diagrams and maps of the things I knew I had "somewhere". They were videos or films, which I had created, which I had seen or even heard of. I took photographs of my home and the videos which were stored around my home, in boxes and shelves (Fig. 8). I drew a floor plan of our apartment and tried to remember and locate all the videos I had in that map. The more I looked and thought at our home and my videos and my ways of thinking about video, the richer it started to appear. These approaches were later to be used on a larger scale. Through doing these observation sketches, I also became aware of the potential of mapping and using

[15] This observation was inspired by a comment from Pelle Ehn in the Media Lab research symposium. I was trying to give an account of metadata and how it is used and what it should be. Ehn suggested, that maybe instead of thinking about *what* is metadata think about *when* is metadata. And that is the track we are on now.

visual data, like photographs, to materialize the made observations and bring them to focus, thereby to look at the mundane from an analytical distance.

At this point, my focus was on trying to find and locate practices and solutions with which people made sense of the media. I was focused very much on trying to make observations, which would lead to improvements in the already established technical solutions. It seemed that most of these arrangements of videos and their environment were made due to simple ad-hoc necessity and functionality, rather than any sophisticated or well-established model or mode of perception. This resulted in the acknowledgement that in reality, I did not have any idea of what the complexity with which people managed their personal media collections. I had to just write down the main observations I had made, trust my intuition, and continue based on these intuitions and attempt to find their meaning later.

The more I reflected upon these observations and tried to remember the videos I had, where they were and why, the more I remembered and became aware of these very *tacit* ways of organizing things as part of one's life. It seemed that I could not easily remember my collected media, unless I would *use it or go through it constantly*. This reminded me of record collectors' habitual reorganization of their massive record collections in different ways[16].

> *Observation: Could it be that through frequent manual reorganization of the collection, one would reinforce the memory traces of each media item? What if digital systems don't need to be organized but that they in fact are organized perfectly or easily in multiple ways? Is there then something missing in them, which would have a place in media archiving applications?*

At the moment of writing this, the impossibility of remembering everything, seems of course, very naïve. However, the reorganization is interesting and significant *practice*. Why do people in general clean things up and put them back into order, and what are the reasons for putting them into that particular order? This type of constant activity of *nudging things which are slightly out-of-place back into their place,* is closer to *the act of maintenance* or *adaptive design,* as discussed by Brand (1994) in the case of architecture and built environments, and Moran (2002) in the case of interactive systems. Activities such as furnishing an apartment, decorating an apartment's interior and then cleaning up the traces which living beings leave behind, are a constant adaptation, *a fight against time and thus entropy*. In the video collections, there seemed to be something very similar at work: using the video materials was in fact a way of organizing the media through constant gardening, taking care of the collection, perhaps disposing of something and making sure it is in a good condition or is brought back into proper order.

> *Observation: What role does this* practice *of reorganization and maintenance play for people? It is clear that it might be done because things get messy, but it also serves to aid the memory of where things are. What role could this observation or activity play in interaction design? If a collection is organized by the computer instead of the user, what implications does this have?*

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[16] This activity is presented in detail in Stephen Frears' film High Fidelity (2000). In the film, the main character always reorganizes his music collection in a time of crisis. I thought, that if in general the organization in personal collections and archives, reflects the life situation of the owner and user of the archive, it might follow that the organization of this type of "life archives", must be done on a very dynamic level, which must be adaptable and migratable.

Moran (2002) argues for a general need for users to be able to adapt their software systems more. In that way, users can adapt the systems to fit their needs continuously as new situations arise, where the existing configuration does not fit to their needs and evolving practices. The work done in Arki research group has studied how technologies become part of everyday life: how information and communication technologies (ICTs) and people's *practices* evolve together. The argument is that these *practices* are the way in which people finally shape the products and integrate them into their lives and that they should be considered as design efforts by the users (Kommonen 2005).

In our apartment, we had a DVD collection, which was located in our book shelf, next to the DVD player, in no particular order (Fig. 8, left picture). Searching through the collection seemed to happen in the following way: when I did not remember where a particular piece was, I first looked at the collections' overall view, and then started to look at specific places, depending on memories of when I had used it before.

> *Observation: How can collections be organized through use, and are they then comprehended by their owners and users through autobiographic memory, filling gaps in between and building it into a coherent story?*

On my work laptop, which I use both at home and my office, I had quite recently started to collect some videos which were sent to me via e-mail or I had encountered as links in interesting web logs, etc. I started to wonder, how common this behavior of collecting encountered videos was. The phenomena of short "net clips", often humorous, which were sent as e-mail attachments or links in e-mails to friends or co-workers, was very familiar to me.

> *Observation: People keep media which they use, even if they don't have any personal motivation to do so. For example, the web clips which I mentioned: why did I collect them? How do people make sense of this material and how does it differ from the other personal media, or media which is watched daily from TV? Where do people keep this material, in comparison to other kinds of material, and why?*

As I had used my work laptop for work and also taking care of personal things, it started to seem very interesting how I really did not make that much difference between work-related stuff and my own personal stuff. In general, they were quite nicely co-located next to each other. Some were in separate folders, but some were in same folders or on the desktop. From the desktop they were cleaned to dedicated folders, which were mostly dumps in which things were not that well organized. An exception to the rule was when I found a folder deep in the 5th level of the directory structure, which had some very private and important personal digital items, mostly text documents, relating to my work and financial issues.

> *Observation: There is a need to make sense of material produced in and tied to different contexts. The structuring is dictated by how one's personal life is organized, by the places and context, and by what technologies are present. Some people, for example, don't want to have work laptops, which would lead to them taking the work data home with them. So, if media is produced in different contexts, is there a need to separate it based on the use context - and if so, how can this separation be made flexible enough, as the contexts are* individual *to each person?*
>
> *Observation 2: What is the need to hide digital media? What strategies can a system afford to provide the user to hide her videos, which videos are these, from whom should they be hidden, and why does the user want to hide the videos?*

Figure 9. A collection of movie tickets.

As I previously had worked as a professional video editor, I also had some master copies of videos I had created. These masters were kept on tapes in different formats, located in a black box which was hidden in our clothes cabinet. It also contained a few of my girlfriend's personal video tapes. The tapes were in VHS format, MiniDV, DVCAM and BetaCam SP. I had not ever personally owned one of the devices which could play those tapes. The tapes were important to me, and I seemed to trust that I would later, if needed, find a suitable technology platform to play them or transfer them to a current format.

> *Observation: People have emotional ties to particular media items, even if they are not accessible to them in their everyday life. To what extent do people trust storage media they use to store their personal data, and how is that trust increased or terminated? New media technology standards emerge almost yearly. How can common people cope with this spectrum of standards? Do they want to cope with it? If it is too difficult to preserve audiovisual media, does it affect the decision to use it? Emulation is often advocated by technologists, but will the emulation technology really be embedded in all the systems in the future, or is it more convenient to always migrate the media to the current industry standard format?*

One other thing that struck me was that I had a directory on the school server, on which I found some of my old videos (which I had done as a school exercise) and one old work project. It started to seem that wherever it was possible to keep something, I tended to put stuff there, as I was aware that it was backed up regularly and had a large storage quota. I knew that my student friends were doing this too.

> *Observation: Is there a need to divide labor in the case of digital preservation? If so, what is to be done and by whom? What is to be done by common people, what is to be done by the technology experts and is there a need for public and accessible support institutions for this, as they obviously seem useful?*

When looking through the videos I had, I also found my collection of old movie tickets (Fig. 9). What is that collection, if not a usage *history* with great accountability? They show the times and dates of visits, with places and movie titles – only the names of the people are missing. But I wouldn't do anything with that information anyway. It was a surprise, that by looking at them, I could not remember all of the movies, but the most cherished ones I remembered and to my surprise, in some cases I often also remembered the people who I had seen them with.

> *Observation: There is a need to make exchanges and events accountable. Receipts and tickets are documents which prove to you and remind you that you have seen this particular film five years ago, even if you didn't remember it. It is also the only material thing which the consumer is left with, when they go to a cinema.*
>
> *Observation 2: Is the ticket collection part of my video archive or not? If I say yes, is there a general need for people to have logs of their activities? If these logs are created by machines from, for example, events of exchange, are they important for users and why? Do they want to keep them? Does it become a part of my personal history, an extension of my memory?*

After encountering these first traces, I realized that I had to look for something very specific to inform my following process. The major shift as result of this self-observation occurred when I realized that the challenge was not so much to look at how things are but at *why* and *for what reason* they are like that.

3.1.2. From home visits into a catalog

The next step in the process was to invade into the homes of six people and interview them about their video collections, and to document the interviews so that they could be reflected upon later in the process. My first idea was to record the visits using video. However, I realized two days before the visits that a video camera recording when asking questions about people's private lives would be a bad idea. The situation would be intimidating enough even without the camera. So, I decided to take photos and record audio instead – a much more comfortable medium for revealing hidden things.

To do the interview at home was a conscious choice. Homes are in today's society multipurpose, fragmented and distributed around geographically. People work at home, study at home, host parties and invite guests to their parties. The home is a place which hosts a very complex and rich group of activities. Focusing my fieldwork on the home environment, I think I have been able to capture some valuable insights about some very critical social practices and values like trust, security and privacy.

I selected the six people to act as interviewees and participants in the design process. The sample is by no means exhaustive, but the objective was to get to engage with the context rather than performing qualitative research. Seven criteria were used to select appropriate interviewees:

1. The person has to be familiar with the recent developments in personal media technologies. *This gave the possibility for what-if-questions or why don't you have this technology at home or have you used this and what do you think about it?*

2. The person has to have some types of video material located at her home and somewhere else too, of which some is self-produced. *It was important that the collection contained material from different sources. If the material was located somewhere else, it was interesting to know, would the person want to own it herself or what kind of access did she have to the content.*

3. The person must be aware of the possibilities to create video material in different contexts and with different tools (ie. digital still cameras). *To be able to discuss mobile video with them.*

4. The person must live an independent life, in the sense that they are not living with their parents or anyone who is taking care of them. *They must be dealing with the maintenance issues of the collection, be it physical or digital.*

5. The person must have produced video material in different contexts: i.e. school, work, hobbies and personal life. *The idea was to find people who would know the idea of keeping video material, which has been produced in some other context, but is thought to be important and kept in the personal collection as a memory. Also, being familiar with the use of technology in different contexts, made it possible to explore what they think about the fact that video is used in many contexts.*

6. The person has to have regular use for video. *It was important, that the people would regularly watch TV and maybe do something else with their TV almost daily.*

7. The person must be of the age that consumer video cameras were not that common when they were born, i.e. 30±5 yrs. *This makes it possible to identify those few occasions where important videos in families or some other context have been created, and to examine the*

interviewees relationships to these videos.

I had to select people I knew personally, because I did not have much time to get to know the people I was going to interview. I wanted to ask them questions which were about private things, and I hoped they would trust me enough to answer truthfully. All the people were in their thirties, some a bit older and some a bit younger. They were all living with someone, two were married, three lived with their girlfriends or boyfriends and one lived in a shared flat with her friends. The interviewees will, according to agreement, be anonymous in this thesis.

I invited myself to their homes, bringing with me an audio recording device (a laptop) and a camera, with the aim to document all possible aspects of their video collection and practices surrounding it. I wanted to capture everything as extensively as possible, and then to be able to reflect upon it later. Figure 11 shows a sample of the photos that were taken during the visits.

Figure 11. Photographs from the home visits.

At that point, I had very limited knowledge of the design context and a strong bias towards how things were supposed to be in the ideal world. This made it extremely hard to design questions and structures for an interview. I also realized that I could not predict what events would take place, which objects and "configurations" people had in their homes. So I decided to develop a very loose framework for a semi-structured interview: 1) I wanted to see every video artefact in their home and document them, 2) I wanted to know which contexts they had used video in, and 3) I wanted to know, whether there were videos located somewhere else, which they would want to have or to find.

I listed for myself certain "tracks of observation" to investigate; a set of qualities concerning single video items in the home's video collection:

1. The physical location of the video item, and its surroundings:

    a. Where is the collection, physically, located?

    b. Why is it there?

    c. What is it surrounded by or is it far away from something? Why?

2. Distribution of the collection:

    a. Is the collection divided into many parts? If so, why?

    b. What are the parts and where are they?

    c. What are the reasons for distribution by the users of the collection?

3. Vocabulary used to describe the items or parts of the collection:

    a. What words are used to describe single items, the collection and parts of the collection by its owners and users?

    b. Do people use characterizing adjectives to describe the collection and its different parts? (i.e. safe, etc.)¨

4. Markings on the collection items:

    a. What text is placed externally on the collection or collection items in particular? Stickers, file names, box names, etc.

5. Classification of the collection:

    a. Are there some elements of informal classification or organization in the collection?

6. Backup copies:

    a. Are there copies made of the collection (i.e. backups)? And by which logic are these backups made?

The discussion was very free-form. I used the camera as an excuse to focus on a particular item which interested me: I would point the camera at something, and ask a question about it while taking a photo of it. This would guide everyone's attention to the object and it was easier to discuss it. It also made the documentation process and what was clearly intrusive behavior, more transparent and polite. This visual recording documented and framed the focal points of our conversation in the video collections, and everything else of significance, so that I could go back to the interviews and experience the site when working with the materials.

Many of these things caught the participants by surprise: why are you interested in this very stupid silly thing of mine? Out of curiosity, I replied. As I had no previous experience in fieldwork, I had the hypothesis that everything is meaningful. So I used my curiosity as a research tool. I had to have the courage to honestly ask people the most idiotic or insightful and intimate questions about their personal stuff.

Observing the everyday which surrounds us is hard. Asking people to verbalize tacit knowledge is hard, and one has to listen to them closely: how they talk and about what. But it wasn't important to make discourse or conversation analysis of the interviews: I wanted just to engage with the context. Also, one big problem in field research was my dual role of designer and field researcher. However, when being more and more aware of the limitations of both these roles

towards the end of the project, I think, the result has been of great importance and would not be possible without this dual role.

Figure 12. Videos and passport kept in the same desk drawer, and videos kept in the same place as a books and a software application.

After the fieldwork, I made a text-annotation of each of the audio recordings, with comments pointing to specific sections of the recordings using time-code information. As a result, I had a set of photos and a set of text and comments, which weren't very useful for me or for anyone else in that format. Also, it seemed that important things, which I could not yet understand, had come up in the process: the hybrid nature of the collection in a technical sense, the unexpectedly high level of distribution and granularity, the many social dimensions of a personal video collection, and how the places and environments wherein videos were stored assigned meaning to the videos (Fig. 12).

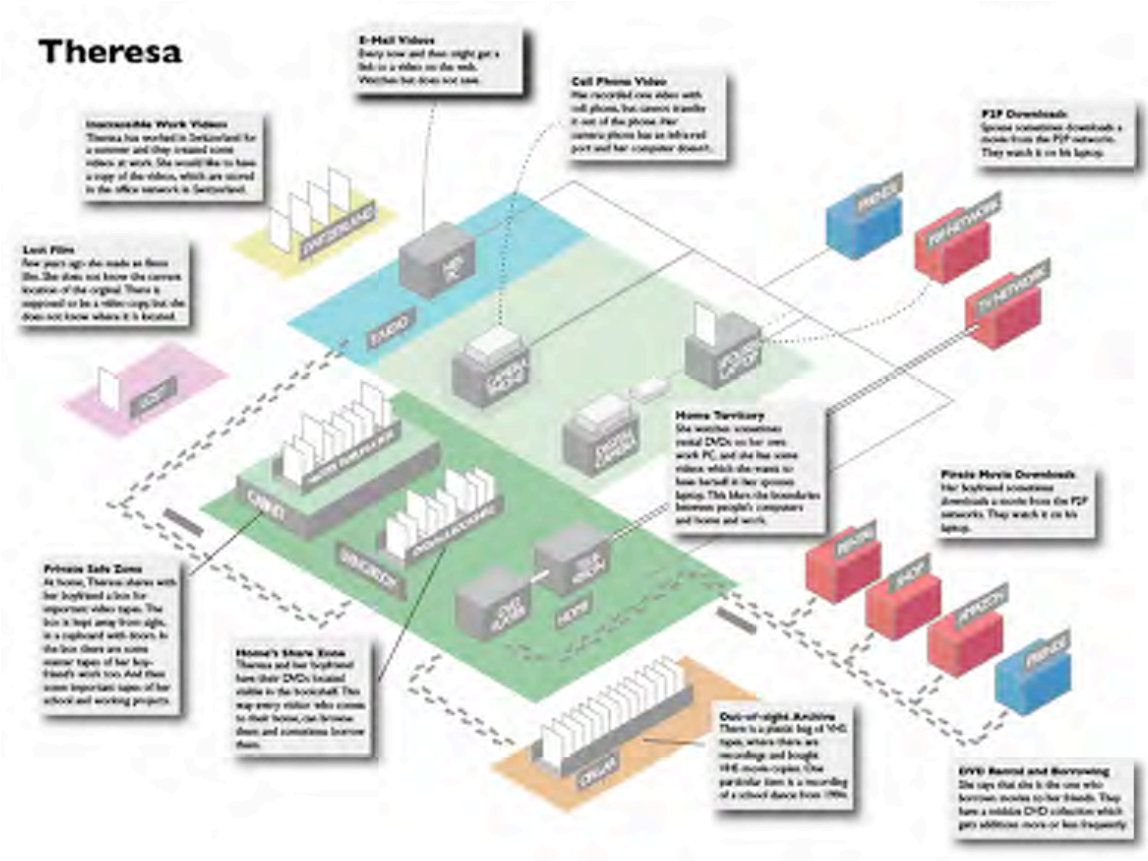

Figure 13. An annotated map of a personal video collection.

Consequently, I decided to create a catalog (Appendix A), which would present a short summary of each visit and group the photos in a meaningful way and give them names. Making the catalog was an analytical process with a strong visual focus. First, I created groups and clusters of the photos, but could not really make any sense out of them. I realized that I had to somehow create some type of schematic or a map, which would help me to provide a strategic overview of the whole collection so that, when presented side by side, the differences would become clear.

The representation system in the map (Fig. 13) is developed based on the system by Kahn et. al (2002), which is used in representing enterprise information architecture solutions. The basic forms were appropriated and new meanings created for them (see Appendix A, Introductory page).

By comparing all of the collection maps side by side (Fig. 14), one can easily use the color coding to see that for example half of the people have lost media somewhere (purple “floor” color). One can also see connections to friends as regards to video sharing through the sneaker net (steps), that video rental is a well established institution in Finland (red boxes down right), that most of the people have a basement storage of old videos which they want to preserve (light brown on the bottom), and so forth. The map is not a design tool, but a representation of complex conditions, simplified into two dimensions. I will present a way to work with this map in chapter 4.

The main benefit of creating this map was to see from a distance the complexity and configurations of people’s solutions for using and storing video. It was easy to see the cultural patterns of leaving media from childhood behind to parents’ homes when moving away from home, or in the opposite event in some cases taking media with them when migrating to another country. Also, this mapmaking should be looked at as creative activity, which creates not only the map as evidence, but also provides understanding and knowledge for the map-maker. This lets the designer work on a level of embodied knowledge required for creative work.

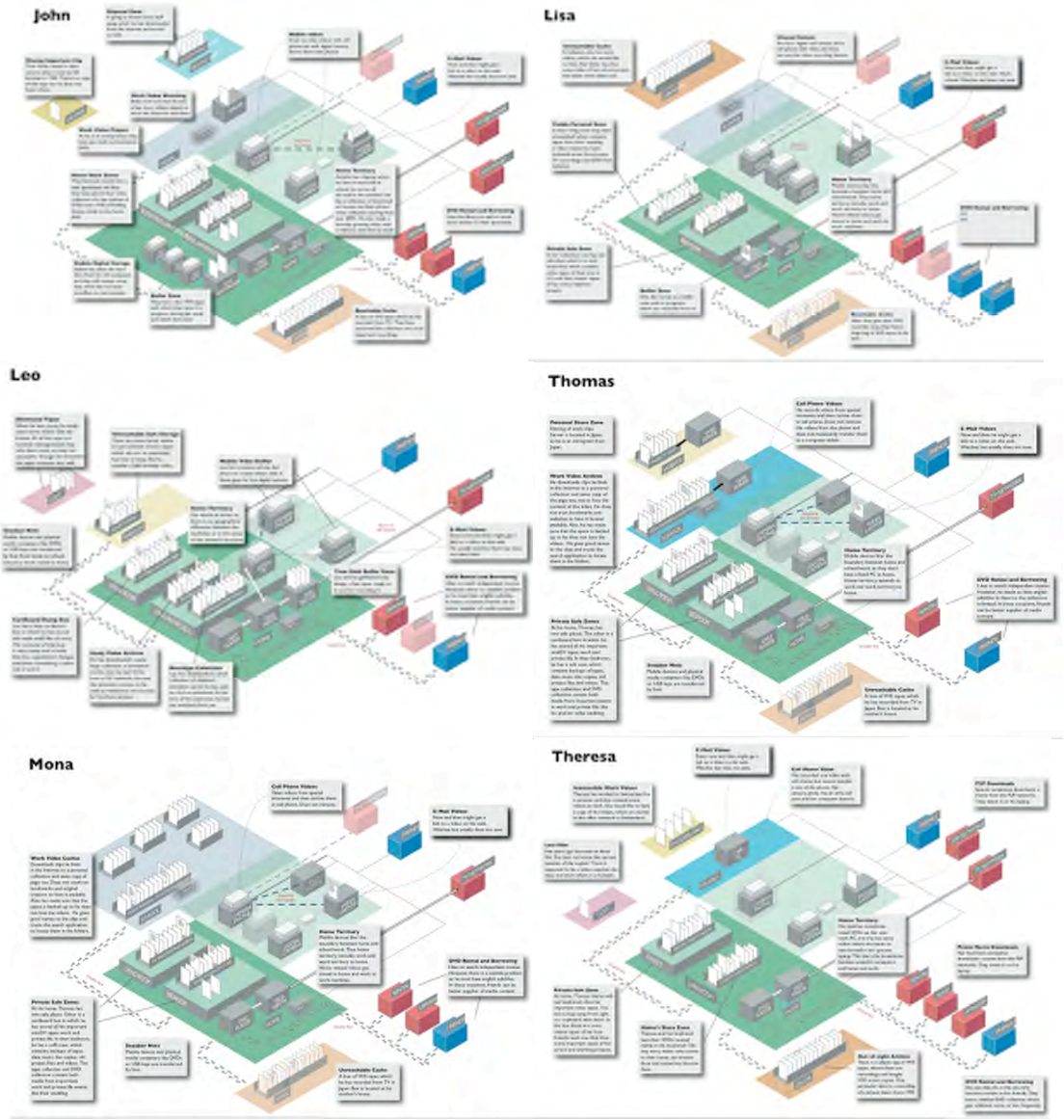

Figure 14. All the maps of personal video collections.

See the catalog (Appendix A) for close-up images of the maps.

3.2. Probing with video prototypes[17]

Prototyping is a fundamental activity in any iterative design process, and serves to develop and concretize the idea, functionality and form of the object of design. Prototypes are also used for communicating and collaborating inside the design organization. Erickson (1995) has characterized prototypes as *catalysts for communication,* tools which help to build a shared ground between disciplines or across organizations. My rationale for using video was that I could easily create prototypes that were simultaneously ambiguous and concrete; speculative stories of how people, technology and media fit together in the world. The video protypes could then be shown to participants in order to have a meaningful discussion, to find out if they accepted the ideas presented and why.

Video prototyping is a feasible way of creating a speculative and material representation of the subject of design, in the form of an audiovisual scenario, interaction sketch or a story. It can be used when producing an interactive prototype is impossible or not feasible (Tognazzini 1994), but also in the case when the object of investigation in the prototype is not necessarily the artifact itself, but the interactions and relationships between humans and interactive systems. They help, if done right, to make the presumptions of designers about the human impacts of the designed technology tangible and thereby debatable[18]. (Erickson 1995)

However, using video in a design project is a risk. The organization of a video production can be extremely large and cumbersome. Audio recording requires expertise and imposes a certain rigidity on how people behave on the 'set'. The biggest challenge, however, is to get people from the design mode of thinking to the audiovisual production mode of thinking. An audiovisual production process does not fit very well inside a design project. It simply takes over how people must behave and collaborate, and it is completely different from design work. Thus, it must have proper interfaces to the design project and serve its purposes as well as possible.

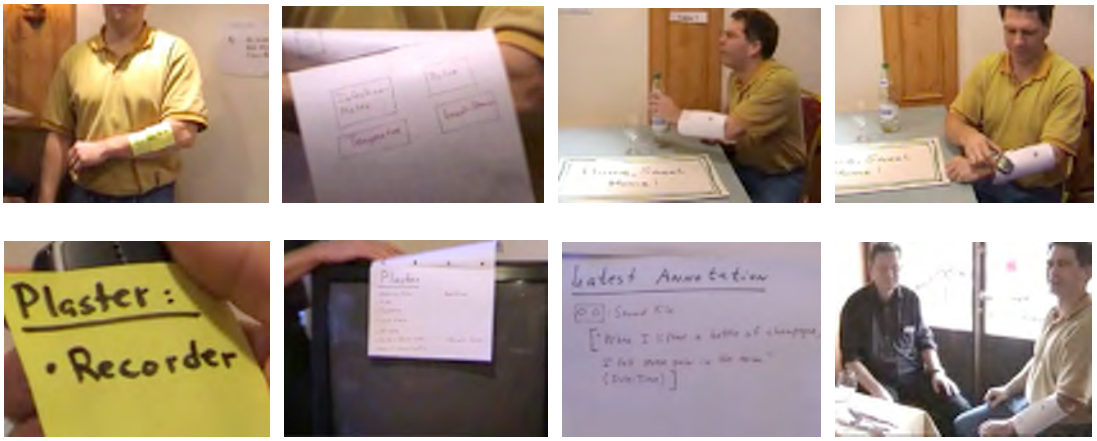

Figure 15. Still frames from the video prototype, which tells a story of a patient and a doctor who both use a collaborative medical information system. (Bossen et al. 2004)

[17] This chapter, especially the sources and references in it, are partly based on Botero Cabrera and Tikkanen (2006). There is an accompanying web page, which documents different ways of using video in design projects (http://mlab.uiah.fi/video-in-design).

[18] Video prototypes have also been criticized for give faulty impressions on what is actually possible or socially feasible, but in my opinion that criticism misses the point of how and for what purposes video prototypes should and can be used.

A video prototype can be a very high-end, professional audiovisual production crafted for the purposes of communicating a vision or for pitching purposes. Examples of this kind of video prototypes are the Apple Knowledge Navigator video (Apple 1987) and the Sun Starfire video prototype (Tognazzini 1994). Another way of approaching video prototyping is through thinking about it as a way of engagement. Bossen et al. (2004) have created a video prototype which is close to a sketch (Fig. 15). It was produced inside a design organization, to illustrate an idea as rapidly and simply as possible by video and paper mockups of user interfaces (Löwgren 2004).

It has been created using a tape-based video camera and edited live in the camera. Members of the design team act out the scenes and the videographer acts as the narrator, who speaks out the necessary voiceovers to accompany the acting out of the story. The environment and props for the video, like information artifacts, are created out of paper, and have some characteristics of classic paper prototypes, but lack detail to be able to work as paper prototypes used for user-interface design purposes (Rettig 1994). Tognazzini (1994) has observed, that this type of sketchy video prototypes can be used inside a design team to sketch and give form to ideas in the early stages of projects, but cannot be taken to the outside world, as they are easily misunderstood.

My personal reason for using video was that I had an earlier experience from working in audiovisual media production, so the practice of making a video was familiar and easy to me and I've been interested in applying video to social situations. I also wanted to find some way, driven by an artistic practice (in this case video-making) to explore the object of design. I decided to approach it in a sketch-like manner, also to explore what level of representation in a video like this is sufficient; how "rough" a video sketch can be while still making sense for other people. Buxton (2006) and Verplank (2003) talk about sketches and sketching as the fundamental way of probing the design space. It can be argued whether using video was feasible in this case: I would say that yes, because classic audiovisual narration and drama can be very effective at representing relationships, tension and dramatic events, and at generating discussion.

3.2.1. Video prototyping interactive systems for video use

In order to start to materialize some of the findings and observations I made, I decided to create sketchy video prototypes out of some system features which I thought were important. The idea was simple: find a way to create as fast as possible an audiovisual representation of the relationship between a user and an interactive system. These video sketches are located on the accompanying DVD (Appendix B). When inserted, the DVD shows two contextualizing images and then presents the main menu (Fig. 16). Single videos can be accessed using a remote controller to select the video.

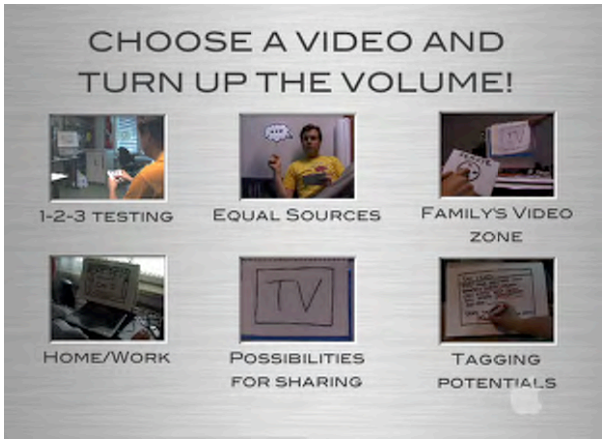

Figure 16. Main menu of the DVD.

I wanted to add something of my own to the method described in the previous chapter: I wanted to make the video a bit more approachable and also make it easier for people to “act” in front of the camera. I also adopted a method, used in some Italian movies, of relieving the “actors” from having to memorize lines by allowing them to say anything they felt like, and then making the final version silent. In addition to the other paper props, I created speech and thought bubbles with the symbols “?” (signifying a question), “!” (signifying a shout or a greeting) and “…” (signifying unimportant thoughts or discussion). Representation was done mostly through gestures, making acting for the participant fun and easy, and it was suggested by someone watching an early trial of this method that it makes the externalization of the inner workings of the “character” easier and more intuitive - a skill which usually requires years of practice and acting experience.

The final artifacts were short 1-3 minute video stories, with one actor in them. They were mostly created in the same office room. Computer screens and other familiar interactive devices and displays were represented by paper prototypes, which were “walked through” during the shooting. The scenario was then narrated using a voice-over, with background music used to get rid of mistakes done in the narration due to the intense and short production time per video. Figure 17. shows a selection of still frames from one of the prototypes.

The video prototypes were used in the process to present a situation in which a person uses a hypothetical system for some specific purpose (Table 1.). The focus was very much on what the person does, and this was the topic of discussion with the interviewees: are the actions meaningful? So in a sense it was more prototyping *action* than the exact interface. I didn’t want to focus too much on the details of the user-interface, as that was not the focus of this study. I intentionally tried to push the sketchiness of the system features to be as minimal as possible, making more assumptions about how people would act.

People understood the prototypes extremely well. Gaver et. al (2005) have written about ambiguity in design, noting that while ambiguity in actual products is frustrating, ambiguity is a powerful design tool if the created artifact is not a product, but serves a function important to particular stages of design process. The artifact’s particular, intended ambiguities can be used to create a basis for discussion and conversations. The prototypes were thus aimed to give a base for discussions on how this technology might influence human lives, what would it add or take away from the richness of the everyday life?

Video prototype #1: “1-2-3 Testing”

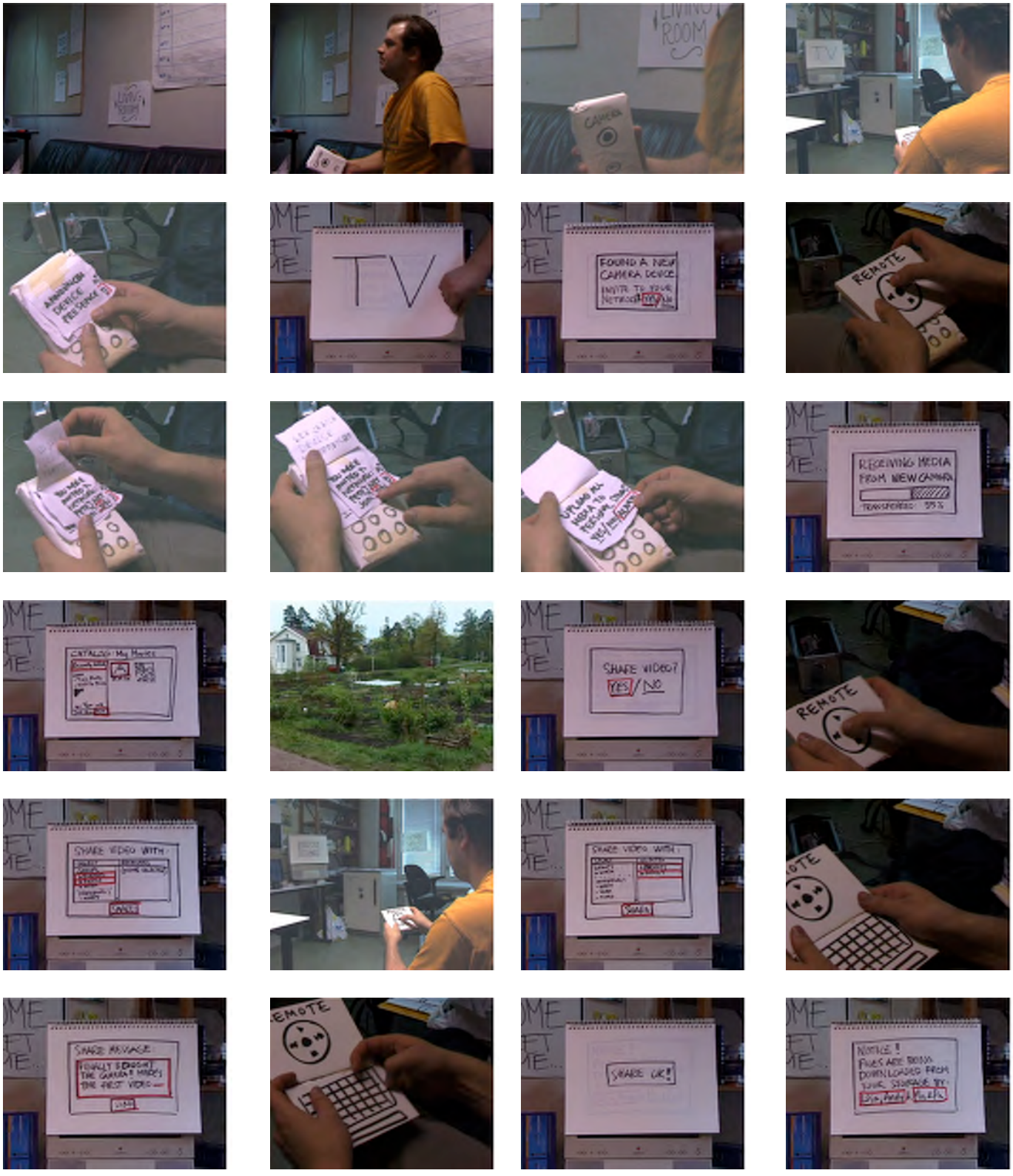

Figure 17. Still frames from one sketchy video prototype.

Name	Story in the prototype	Function
“Testing 1-2-3”	A man records a video with his camera. He brings the camera home and the video is downloaded by his home computer to its system. The system asks the person to describe the video and whether he wants to share it with his close affiliates. The system then notifies these, whose systems automatically start to download the material.	To communicate the idea of creating a shared collection of self-produced videos by automating certain processes needed for copying the videos to others.
“Equal sources”	A man watches TV and browses channels on the TV. He looks through commercial TV channel offerings, but then turns to look at what his friends, who share their watching information, have been watching. He notices that one of his friends has seen a film, but finds the information provided by the video-on-demand system insufficient and calls his friend to consult about the quality of the video. He watches the video and then rates the video but does not want to leave a comment about it.	To communicate the idea of sharing the activity of tv watching and hinting at the possible communal aspects of interactive TV. To spark discussion about the communication and level of information needed for “recommendation” systems and who hosts the information.
“Family’s video zone”	A woman watches TV. She looks at what different members of her family, who are located around the world, have been watching. The family channel shows information about every one’s viewing of commercial TV programs and also home videos. It has a special place for home videos, but the woman does not want to see the new videos which have been added there. She in stead wants to watch the same program her mother has been seing, so the system downloads it from her mother’s system to her system.	To discuss the blurred area of what a “channel” is, what is a collection of videos, and where they meet. To ask the question: with whom would the interviewees share their videos or watching habits, to create more sense of community?
“Home / Work”	A girl is working at home. She needs to find a video which was used in some work a few years earlier. She opens up a “Video Log” application, which has records of every video she has watched, and from what source or context she has received them. She browses through the collections by year and finds the video.	To discuss about the idea of increasing media collections and the possible need to store everything. Also, to discuss the ideas about a system that monitors and records how you use it.

“Possibilities for Sharing”	A woman watches TV. She notices that her sister (who recently moved into a new apartment) has joined the family channel. She decides to upload a video of a party she was in, to the channel. She uploads the video and shares it with her family. Afterwards, she sets the preferences so that all of her watching information isn’t automatically shown to others, but the system has to ask for permission from her.	To illustrate the idea of how a family or another community or group of people can enforce their communication through information technology and how it can scale.
“Tagging potentials"	A man watches TV. He watches some video about his friend and tags it with keywords after watching it. He then uploads more videos to the system, and tags them all with the same set of keywords, which he specifies after uploading the videos to the system.	To raise the question: what is doable, what do people want to do in a situation like this? Is even this simple categorizing a too heavy task, cognitively?

Table 1. Contents of the six video prototypes

When making the video prototypes, the catalog from the field research was not yet completed. This pushed a certain level of ambiguity on the content of the prototypes and mixed stories. Certain familiarities in the technologies were present: television’s functionality was extended: it could be used to access a shared repository of audiovisual media, and the remote control could do a little more than just skip channels. The computer had a new application, which made it possible to browse the media use history of the machine. In general, there were no new gadgets, but the old ones had a bit more functionality and sophistication than before. In the stories of the video prototypes, technology and media connect people to each other. The attempt was to create and improve the conceptual models and designs of the devices already available. This was a design decision based on intuition and has remained in the example scenario, presented in chapter 5.6.

3.2.2. Using the video prototypes in an interview

Based on the understanding acquired from the home visits and producing the catalog, the schematics and the video prototypes, I invited the same six people whose homes I had documented in the field study, to an interview in the office. I showed the video prototypes to each interviewee, and then we had a discussion surrounding the themes presented in the video prototype. As most of the prototypes are about very short-term activities, the idea of long-term archiving was moved to the background, in order to reduce complexity. The intention was to present to the interviewees how media archives might be created, maintained and shared with friends. Also I decided to focus on comprehending the videos and their potential uses.

The environment for the interview was the same place as in the video prototypes, which made the intentions and “cinematic effects” transparent and easier to relate to the prototypes. The structure of the session was once again very simple: 1) we began by going through the catalog information of the particular person, 2) we watched the videos one by one, 3) we discussed about the video after it was watched and 4) I asked a small set of control questions about the previous answers given by the interviewee. The interview was recorded to video. One person did not want to be recorded with video, so I had to use only audio in that case.

As mentioned before, the sketchiness of the prototypes was a risk, but the interviewees seemed to understand everything necessary. The lack of clarity was more a result of cinematic or technical roughness in the video prototype, and this was easy to explain. Some people objected to the stories that had family members present in the family archive. However, after the reluctance to the concept they realized that they could probably have their friends there, too, as they weren't that close to their parents at the moment.

In general, the videos were well accepted and the promises in the videos were considered nice and inspiring. People could find use for them. The video prototype with the logging application was criticized by half of the people but also appreciated by the other half: in general, the ability to access time-based use information and navigate large video archives in a sophisticated way was thought to be a usable thing. In the same prototype, work and home materials co-existed in the same place: this caused resistance in all except one person, who worked at home and whose computer was already used for watching films as well as working.

Generally speaking, the ideas about having such conveniently accessible video archives of important media, were taken very well. Naturally, the question which I was expecting, came up: do people really want to do that when watching TV? In my opinion, this is a problem particular to this generation, but not so much a general convenience problem. Features can be hidden and designed so that they are suitable for everyday use.

3.3. Summary

The design exploration consisted of many iterative processes, which were each concluded at some point and the ideas. The observations were translated to the next part of the process and new artifacts were created one after the other.

Through the field study, I was able to convey myself the right context and eventually make the right observations leading to the creation of the final results: the account on the practice of informal archiving of audiovisual media, which is presented in-depth in chapter 4. And the design proposals: five principles and one scenario to illustrate the principles in action, presented in chapter 5.

4. INFORMAL ARCHIVING OF PERSONAL DIGITAL VIDEOS

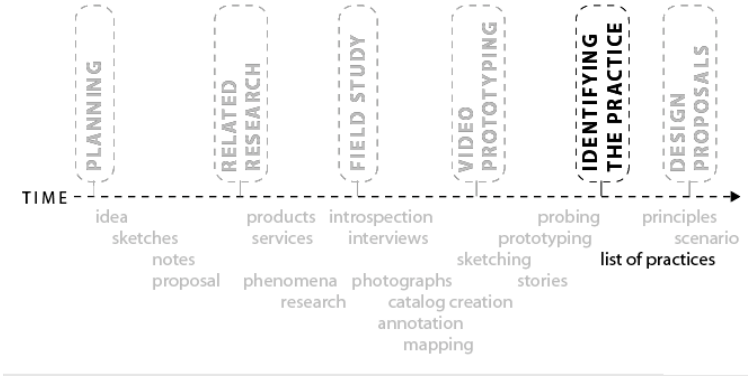

Figure 18. Timeline of the project

Humans have a tradition of creating systems for keeping and organizing things for specific purposes, situations and times – or just for keeping's sake. These systems and components serve to reduce complexity in the material environment. Consider the items in Figure 19 as archiving systems. These systems and system components are *controllable storage environments, which have sufficient organizational and temporal qualities, and where things can be put into, kept in and taken out from.*

Figure 19. Different archival systems: pocket, purse, desk drawer, handbag, envelope, file folder, filing cabinet, bookshelf, archival building.

Buchanan (1995) names one of the domains of design to be the design of *"complex systems or environments for living, working, playing and learning."* I would add to that *design of systems and environments for archiving and preservation.* These systems can create temporary order and stability in the world. In most cases, the element of *keeping things organized, safe and ready for use*, is pervasive and present in most of the products which exist. In modern society, keeping things preserved in systems (as opposed to disposing of or destroying them) is considered a good in its own right.

I call this keeping of things *informal archiving*, to make the distinction with the professional discipline of *archiving*. There is *an existing* discipline of archiving as well as people who are professional *archivists, librarians or have training in information science.* The everyday informal archiving is very much different from the archiving carried out by trained professionals, and cannot be approached with the exact set of tools and concepts of the professional disciplines. However, it is useful to be informed by their approaches, motivations and expertise, as they are related practices.

In particular, I will look at informal archiving of *digital video.* Video is by its nature a signal, encoded and stored in a storage medium for later use. The invisibility and intangibility of this signal leads to the fact that stored video signals must always be stored in objects (tapes, discs or video files) that are *containers for the signal*. Even in the simplest uses of video, there are already some elements of preservation and archiving present. Considering this, the question becomes *what kind* of information marks should be added by machines or humans in order to enable users to find specific content, and in order for the videos to be storable, accessible and usable in a feasible way. Furthermore, it is a matter of whether those marks are purposeful, visible, and whether they are used or not. [19]

Figure 20. Writing on tapes

Total solutions for archiving fail to identify the context of archiving and the need for casual, informal video storage and use. I will argue that the problem is on a much lower level, related to *when and where* and in *what context* video material is used, placed, grouped, organized and given meaning to. Given that an archiving system for informal archiving is a design problem/challenge, I would argue that the wrong way to approach this problem is to attempt to create such a system that can be used to achieve perfect and total, hierarchical order into a collection. Fig.20. presents very informal markings on video tapes. I find it hard to believe that, given a computer instead of a pen and a sticker, people would instantly start coming up with better names and categories through which to sort media. The system must support some simpler way of organization than categorization. A better way to approach this problem is to create a system which provides *sufficient* order to the collection for particular use, much like a pocket for keeping a set of keys.

The metaphor of a file system is a good example of a way to organize digital data: it works best when the user has had training in filing or has developed a sophisticated practice for using the digital file system. In general, however, it is often acknowledged that the file system metaphor is not suitable for everyday informal use. In recent years, there has been a massive increase in both the amount of data and in the amount of different data genres that are stored in the typical file system. This increase has made the organization of media into folders an ever more cognitively difficult task, clearly showing the limitations of file systems. One example of the problems with file systems is the application of file names, used to identify and describe files in a personal computer (Raskin 2004). If the user cannot come up with good names for files, as well as a sophisticated folder structure, the file system metaphor is useless as users will end up naming the files in totally arbitrary ways.

[19] A simple way to make the task of archiving easy for oneself, is not to archive at all. This solution is applied successfully by many people. However, to propose it as a solution to the problem of archiving digital media would not count as academically sufficient.

4.1. Identifying informal archiving

Traditionally, formal, professional archiving is a self-conscious activity that happens on concentrated psychical sites - usually referred to simply as "the archive" (as seen in Figure 19.). These sites are environments dedicated to "the archiving activity". Examples are the archives of governmental institutions, libraries, companies or any other communities. The practice of formal archiving is carried out by paid workers who have expertise in handling, archiving and preserving the particular archive's items (Pedauque 2004).

An archive should be understood not only as a collection of items, an environment, or as the information of the archive's collection, but also as an institution encompassing people who have expert training and knowledge, and who perform work-related tasks within it. For the case of digital libraries, Agre (2003) has summarized the discussion with the question: "Is a digital library a machine or an institution?" It depends on how you want to see it, or maybe: what you want out of it, what is needed to invest in it for it to work sufficiently, and what "*sufficiently"* means.

Table 2. presents some differences between formal and informal archiving. This is not meant to be an exhaustive presentation, but rather a rhetorical device to make the point that the context for informal archiving is different from that of the formal archiving and thus the systems and approaches for designing archiving systems should be different. It doesn't aim to define formal archiving.

One way to approach this problem is to ask what happens if all the informal places for keeping things would be considered as archives. If so, what would be their characteristics? What would be the characteristics of their use and users? Pondering on this track has lead me to believe that a single, pervasive solution is not possible, but that the individual must able to combine different archiving solutions, and consequently that archiving solutions must be easily created by and accessible to non-experts.

Characteristic	**Formal Archiving**[20]	**Informal Archiving**
Who performs the archiving?	Archiving, the design, organization and maintenance of the archive, is performed by archivists or other experts who have resources dedicated for the task.	Archiving is performed by non-expert "archivists", typically for their own particular uses, and to support their activities and everyday life. In most cases there are no dedicated resources or time to perform it. It just happens.
What is the location of the archive?	The archive usually aims to be in a centrally located, controlled environment, which suits the purposes of the archive.	The archive is often located where the use took place. Centralization is not convenient, distribution is the best practice.
How are things described or	There is a naming and a classification system in use to	Schemas and naming are free-form and unstructured. A lot of the

[20] The set describing formal archiving is not exhaustive and it is based on the ideals presented in The Society of Archivists' (1993-2004) "Best Practices Guidelines" and the Society of American Archivists' (2002) Guidelines for a Graduate Program in Archival Studies.

classified?	describe the content, located in a collection database or card file.	information is written on the particular archived items.
How are things organized?	The main principles that drive the organization are predefined and maintained through hierarchical taxonomies. Taxonomies guide the placing of the content in the archive	Principles which drive organization are low-level spatial organization, grouping and clustering based on similarities in content or use.
How is the activity seen?	The ideal is to preserve the original function and historical context of the archived item.	The ideal is to preserve the original function and context, BUT also to anticipate convenient future uses and contexts, for example by naming.
How well-informed is the archiving practice?	Guided by strategic, informed decision-making.	Guided by local, situation- and individual-specific information and knowledge, which is often insufficient.
Are there dedicated resources?	There is often a budget and workforce for obtaining an archival system.	No dedicated resources, using whatever is available.
Controlling the environment?	Awareness of the environmental conditions, attempt to control them.	Unawareness of environmental challenges, no attempt to control the environmental conditions unless a catastrophe happens.
Is the activity conscious?	Archiving action is a conscious deed.	Archiving action is often an unconscious deed, i.e. an item is born and left somewhere to exist.
What is the policy on copying?	Original copies are valued.	Replication, preservation and reinterpretation are valued.
What guides the activity?	Archiving action is guided by disciplinary practices and principles like provenance.	Archiving action is guided by casual convenience.

Table 2. Some differences between formal and informal archiving.

4.2. Informal archiving of media and infrastructures

One way to understand archives is to see them as *byproducts of human activity.* This means that not only the production of the items in the archive, but also the form and location of the archive are results of human activities. Larkin (2004) has documented how an infrastructure of media distribution, reproduction and storage can act as an archive, and offer support for the birth of

creative expression and new audiovisual media practices, the formation of unique genres and social functions for the media.

Larkin focuses on the media piracy networks of Nigeria, which at present are used to distribute local, unique, cultural products. He thus proposes that the media piracy network is an archive, *an informal archive,* which is created out of necessity and with no professionalism involved. Larkin's description of the way in which the infrastructure of piracy has been put into use by the media pirates, is a *social innovation*[21]. The innovation lies in using a network, whose nodes can copy and cache media, thereby creating material flows, for the purpose of creating an archive for cultural works. (Larkin 2004)

Figure 21. Personal video storages of video recordings

Central to Larkin's argument is the concept of *technological breakdown,* and the uncertainty caused by media technologies working or not working the way they are expected to work. I.e. they are too cumbersome, too complicated to use, or simply inaccessible. In this breakdown, the informal activity of media piracy is born. Media piracy networks rely on the technologies of storage and extremely affordable media reproduction leading to the constant creation of new, low-cost copies, thus creating a distributed, temporary archive of the particular media artifact, which is based on replication. Larkin's research suggests that in this kind of uncertain environment, an infrastructure of transport is not as important as an infrastructure of reproduction and storage (Larkin 2004). The similarities to preserving digital data in everyday life are obvious, especially regarding video: it must be made available and usable through recording to a tape (Fig. 21). It is also tempting to look at the success of YouTube, through the eyes of Larkin's study: when point-to-point[22] video sharing is not feasible and is difficult to organize, an intermediary, which offers storage, can create a cache for the purpose of a blossoming culture of web videos.

The significance of replicating personal digital information has also been one of the key findings in an ethnographic study conducted by Microsoft Research on how people *manage and keep* their personal digital data. Their study found out that making copies of existing data or media is

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[21] It is provoking to consider crime as a social innovation. It can be easily opposed with legal arguments, i.e. the infringements of intellectual property. However, for this thesis' purposes, it is important to look at the actual actions and cultural practices surrounding the network of media piracy.

[22] Technical term for describing a network connection which connects without intermediary services from one point in the network to another point in the network. (http://en.wikipedia.org/wiki/Point-to-point_telecommunications)

a key element of the informal media archiving infrastructure for those who don't have a grasp on archival technologies, institutions or distribution networks (Marshall et. al 2006).

4.3. The informal archiving of personal digital videos

In the media industry, there are two parallel logics regarding the use of video: *the logic of consumption, production and distribution*, and the *logic of archiving*. I present them in a very simplistic timeline (Fig. 3) to open up a discussion, and to identify some of the issues which exist in the context of informal archiving. From the diagram, it can be seen, that in the professional context, these two logics are different, and that they have different aims: the aim of the logic of consumption, production and distribution is to move and create things, make the media flow. The logic of archiving is there to serve the previous logic through creating stability and keeping the materials accessible at all times. We could say that archiving is *infrastructure* for video production, consumption and other uses.

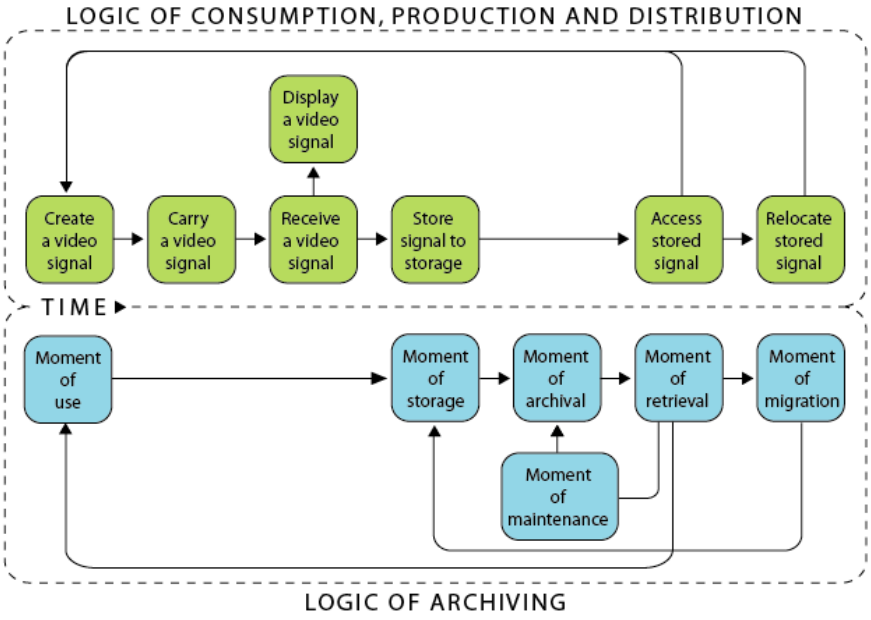

Figure 22. Logics of production and archiving.

If these two different logics operate at the same time, how can their different aims be reached in everyday media use? In the professional tradition, people who work in the fields of consumption, production and distribution, and the people who work in the field of archiving, are separate from each other. They have different skills, expert training and work practices in order to fulfill the aims of these different *logics.*

However, when audiovisual media use in its all richness starts to occur more in the everyday life of people, they will suddenly have to deal with all of these tasks themselves: they want to be productive and get things done, but at the same time they must take care of the archiving and maintenance of the collection. Where does one find the skills as well as the time and motivation to "clean things up" or add proper, new metadata to the media? Or should the whole idea of personal media use be approached from a different point-of-view, which would focus not on classification but some other types of organization? (Fig. 30)

Figure 23. Personal media material in an *organizer.*

The continuous and daily capture of media*, life recording*, and the needs and practices to use media in increasingly different situations and contexts, require more and more effort to be put into the archiving of the content. It this context, it is necessary to resolve the appropriate division of labor between humans and machines. My conclusion is that the logics of production, distribution, consumption *and archiving* must be used at the same time, as there are no other simple ways to deal with these tasks when trying to improve the user experience of digital media.

4.4. Practices found in the field study

I have compiled this list of different practices which was encountered in the field study. Each one of the practices will have a name, a small description where it was found and then a connection to the catalog photos and schematics.

Name of practice	**Description**	**Catalog image examples**
Creating and appropriating places for video storage	People design and take into use places which suit the purpose of doing something. For example a safe place for important and valuable videos which might exist only through that copy.	**9:** preserving personal videos with the passport. **57**: A box for important tape preserved in a cupboard. **5, 20, 78:** Videos are kept in the bookshelf with books.
Hiding video	People hide important private but also non-important videos which are not used.	**17:** Videos in the basement **28:** A MiniDV master tape collection in a box.
Time-shifting buffer collection for short-term storage	When wanting to coordinate video watching, recorded shows are usually kept in a special part of the collection for some time.	**7, 26, 34, 69:** Tapes next to the video player
Making a temporary video as part of the permanent collection.	Decision to keep something for a longer time, for example, a recorded TV show.	**39:** Movie taped 10 years ago **48:** David Bowie concert recorded from TV
Recording a TV program straight into the collection	Some people record a specific series and they have a place set up for them in the collection.	**64:** Recordings of Friends, the TV series
Appropriating video: from commercial to my	Recording video, buying video and placing it into my collection	**S4:** Collection of animation series from childhood,

collection	with my meaning, downloading pirate videos from the Internet.	downloaded from the Internet.
Making a distributed collection	Locating parts of the collection there were they are the most useful.	See the maps of all collections.
Remembering videos and their places	People remember where they put particular videos.	**1:** Bookshelf helps to organize
Remembering the social traces of videos:	People remember, where did I get this and who I watched this with	**22:** DVD gotten from mother **60:** A contextualizing note attached to tape.
Television watching and file sharing creates an archive.	Appropriating content and non-rigorous maintenance of the archive leaves behind copies of videos into the collection.	**S4, S5:** Videos downloaded from a file-sharing network **67, 81:** Collections of recorded movies and TV shows, which were never disposed.
Keeping videos	People have made a decision to keep some particular video.	**39:** A video tape recorded ten years ago.
Acquiring a video for someone else	Recording a TV show for someone else	Many of the participants had tapes from others in their shelf.
Sharing the archived item together, watching it together	In-family storage of videos, then it is watched together.	All of the collections had shared video items.
Uncoordinated communal preservation of materials	People keep material and others don't know that someone has kept the video	Some stories of this were mentioned by a few persons of how old tapes keep turning up.
Family archiving	Groups of people have a tendency to keep the media which has been created in a group.	This can be seen as in all the maps of the collections, many of the people had "some tapes" from their childhood in their parents place.
Organizing through use	When using videos, tapes are left into a new place after use, the self accidentally becomes reorganized, etc.	**69:** The tapes are shuffled back and forth from the recorder.
Cleaning up	Bringing back the lost order to the collection.	It seemed that the more videos there were in the collection, the less in order

		they were. .
Traces of exchanges	It might read in videos, whose tape this is and who has given it to you.	In some tape there was some markings on the tape, who owned the tape before they did.
Receiving as present, giving a present to someone	A video is received as a present straight to the archive. Some people have special places in their homes for presents.	Mona's collection had a few tapes which were received as gifts, no photos of them were taken.
Lending videos to friends	Giving the video to a friend to use for some time.	Leo and Mona had videos, which were someone elses.
Asynchronous watching of recorded videos	Asynchronous use of same material in homes.	69: Time-shift tapes are being watched by everyone, often separately before running them over with new programs.
Classifying the videos based on where they are located	Giving different parts of the collection different meaning. Private videos here, recordings here, commercial DVDs here.	This was evident in all of the collections. They usually were located in bedrooms, in boxes under the bed, etc. Each place had it's own meaning.
Browsing the collection visually to locate material	Glancing to see the whole collection, an overview of everything.	This was not observed as such, but at John's home, the collection can be glanced really fast. (1)
Create a video straight into the collection	A video is created with a camera phone.	John had created a video with a webcam, It was still in the laptop's hard drive.
Valuing the organization of the media	People value their own organization system. For example, when those who were using the file system to organize media, were reluctant to switch from their own to a media manager.	**SS1-5:** self-made folder structures for preserving media.
Migration of content	Moving the media into a new environment means in practice new organization.	John had his videos on a set of DVD discs. I didn't check, how they were organized in the disc
Reorganizing of collection	People like to reorganize the collection, when it is scaling and the old system doesn't work	**72:** The tapes in the backrow are put there to keep it steady. Thus, the only part which

	anymore.	changes is the front row.
Adapting the archive to new use situations	Creating new places, reorganizing the old, changing the order of the media.	The results of this were visible in the time-shift buffers.
Marking videos	Putting some type of mark to the video to know what it contains.	**82:** Tape contains the markings RB, which stands for Raging Bull.
Making abbreviations of content and leaving it there, .“sufficient metadata”	People give some types of names to the items.	People had markings, someone had a tape called “Recording tape” which was used for recording what ever was needed to be recorded..
Adding new stickers to tapes if one wants to write something there	If there is no way to write to a tape, a way is created by people themselves.	**38:** a custom sticker on a tape
Grouping similar or associated videos	Grouping also can create a place.	**32:** Kubrick DVD box set is grouped beforehand. **S4:** Nostalgic animations are in the same place, grouped, if you will.
Removing videos from the archive	Disposing of videos, when they are not kept anymore.	**17:** These discs are going to trash.

Table 3. Practices found in the field study

The presented list of archiving practices is only a list, but it is quite exhaustive and supports well the purposes of this discussion, of developing a set of design principles.

5. DESIGN PROPOSALS

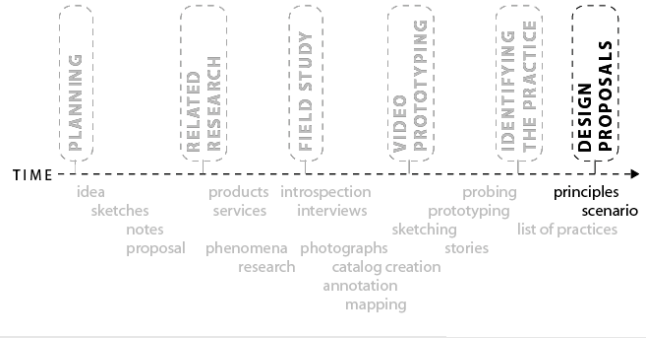

Figure 24. Timeline

Informed by the identified practice of informal archiving, presented in chapter 4., and the different ways or organizing and archiving media, presented in chapter 4.4., I have constructed two design artifacts: a set of design principles and a scenario that illustrates how these principles could be applied in a system. The principles and scenarios communicate the way how media is optimally archived and organized in different contexts and uses.

Proposal for a set of design principles

1. *Video needs a place to stay*
2. *Using is archiving and organizing*
3. *These videos belong together*
4. *Marking surfaces for digital videos*
5. *Sorting videos out*

These principles illustrate the need to support different levels of organization in media archiving systems or systems which are used to consume, produce or share media. Each of them is connected into a context in which each of them is meant to be used. They can be deployed in any context, but the focus here is on using them in a socially meaningful place and as much as possible, as a byproduct of the meaningful use of applications.

The principles provide a set of infrastructural features for informal archiving, which begins from the very low-level safety net of organizing media through placing it into a particular place, to providing users to utilize and create sophisticated classification systems through meaningful classification. I argue, that when the amount of media increases and the diversity of media uses grows, sophisticated ways of organizing it become necessary, but the more low-level needs of organizing won't disappear.

These principles are especially useful when dealing with media items that are meant to be used in open systems, across the boundaries of different devices, applications and services. They attempt to provide an overview of how media could be organized fluently when it is used as part of everyday life and there is no dedicated labor available to do the archiving for the user.

5.1. Video needs a place to stay

Context

Video has to be in some *place* for a specific *time*.

Rationale

When a video is located in a particular environment, it means that it is in some *place* that has specific function and meaning to the outside world. The place is born out of a *practice* of placing videos there or to some some place with similar qualities. The practice cannot exist, if the place doesn't meet the technical and social requirements. In other words, a practice finds a place for itself but a place also makes a practice possible.

Principles

Design the place to suit a specific activity *(examples: preservation, archiving, sharing, backups, dropping, displaying, pick-up, time-shifting, disposal, keeping things secret or private, safe-keeping, remembering, editing and viewing videos).*

Design the place to support activity to last for a specific time *(examples: temporary, long-term).*

Design for the right levels of access and visibility.

Design for interoperability with the surrounding environment and other archives, keeping *metadata intact on transfers.*

Design for adaptability. Allow the possibility for users to create and change the above-mentioned qualities of a place, if it suits their needs.

Design for trust: a video is not put into a system unless it can be trusted to fulfill all the user-expectations regarding the ways the system works and how their media is preserved in the system.

Issues

Division of labor: Who provides and maintains the place? Does the place provide you a set of tools to perform the activity that a place is intended for? Or do you have to bring your own tools to the place? In the case of adaptation, how is the division of labor between the user and the system made?[23]

Policy for use: What can be done in a particular place? What is allowed and what is not allowed? What are the restrictions materialized into the system and what are social agreements regarding the use of the system?

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[23] In the case of buildings, people are given the possibility to furnish and renovate their apartments to a certain degree. Basic building infrastructure like plumbing, electricity and supporting structures can be only changed by experts and in the case of larger living complexes like apartment buildings, the building maintenance facilities are centralized and services outsourced.

5.1.1. Safe places

Based on the field study, a safe places seems to be needed in informal video archiving. The safe places, which were encountered in the field study, have certain characteristics: first they were located inside a building, behind closed doors. In the apartment, they were kept in, for example, a closed box on-top of the bookshelf where no-one can reach easily and the videos were thus hidden visually and it was impossible to know by just looking at the box, what it contained.

A safe places is created when the complexity and chaos is reduced to a sufficient level. The complexity can be reduced through adding layers of organization and access on top of each other.

5.1.2. Places for media sharing

Media sharing is the word usually implying distribution which does not contain monetized exchange of goods. Video sharing services and the social media phenomenon build on the idea of offering places for sharing

5.1.3. Overviews and glances to a place's activities and contents

For a place to remain trusted, overviews of the activities in a place need to be presented. Visualizing activity of the events happening in a place, awareness of the place's meaning is enforced and continuously reconstructed. Overviews of the whole collection and its structure and locations of materials can provide guidance for strategic decision making in the case of potential changes in the content or reorganizing the collection structure.

5.1.4. Places inside applications

A media application should provide ways in which to create a variety of places inside the manager application, ie. "To be watched", "Edits in process" and "Shoeboxes" for sorting out media later. For example, iTunes can be characterized as being a place, as people talk about how they have all their media stored *in* iTunes. It has certain characteristics and affords certain types of actions, ie. different functionalities for the users (playing music, managing music, burning music to disc, etc.) and social aspects (different ways of sharing music).

5.2. Using is archiving and organizing

Context

Using media equals archiving and organizing media.

Rationale

Digital systems lack the properties of the physical world. This has traditionally been considered a virtue and a possibility. Recent years have seen the advent of materializing social characteristics of the world into software, which has then been called social software. I argue, that interactive systems should be designed so, that they *make use accountable and at the same time, organize themselves through their use.* Consider a book: if it has been read 200 times, you can see it from the book. If a book has been taken from a bookshelf, other books are leaning over the empty space. In practice this means, that the activities of the system, the use of the archived media material and videos, are captured and this data is used to adapt the system. This will make new social dynamics and development of rich social practices possible when using the system.

Principles

Every action performed to the archive or video material in the archive, should leave a trace into the system. This brings accountability to the system that the physical world has.

Design the system so, that the media archiving and organizing happens through using the system. In the case ofcapturing a video with a camera creates a timestamp and maybe some other contextual metadata which can be used by for example. a media organizer to find your media. In the case of sharing or publishing video into a specific community, a tool for describing the content is meaningful. When a video is watched in the archive, capture the watching event. It can be shared to trusted people to work as a social cue.

Bring a strong time dimension to the system through organizing information based on *event data*: *when* and *why* happened *what* and by *whom?* When designing a system for multiple uses and flexibility, it has to be adapted through capturing its use: the use data can be then used by the user or the system to create meaningful ways in which to organize the media.

Issues

Obvious issue here is privacy. When is this approach violating individual rights or intimacy? On the flipside of privacy is trust. To be able to gain trust, you must often reveal yourself or to reveal yourself, you must trust the environment.

5.2.1. Archiving is part of applications

The other side of this principle is that archiving becomes a part of applications. This means, that archiving features should be built into applications, that use the data or are used to create the data. A good example of this evolution is a modern e-mail application.

5.2.2. Social aspects of video use

To be able to represent the social qualities of a place, the activity which is happening in a place, must be visible to all the users of the system. For this to happen, the use must be captured. This means that the use of this system provides a good basis for users to *coordinate and communicate* their activities in relation to the system

5.3. These videos belong together

Context

Create an association between two or more videos.

Rationale

Association is a powerful organizing tool, which requires no verbal output. It is about people or machines declaring “what belongs with what”, *which videos are associated.* In the case of video it means playlists and edit documents – or in some rare cases, links from a video to another. Grouping is based on the ability to make distinctions between things - a human is good at spotting affinities and making connections.

The associations can be made into clusters and groups. From the point-of-view of a system, a pure association should signify only the association and nothing else, however humans can perceive the quality of the association and human input in pre-defined or ad hoc contributions to

identify the meaning of associations should be *valued but not expected* when designing for informal archiving (see sections 5.4 and 5.5).

Principles

Enable users to create groups of video in the form of simple sets, playlists or edit documents.

Enable the possibility to manipulate and access these groups so that the object of manipulation and access is the group and the videos inside it.

Enable marking or classification of these associations (see 5.4. and 5.5.)

5.3.1. Playlists and edit documents

A playlist is a convenient and meaningful way of grouping video. It contains a set of videos in a specific order. An edit document is one step more advanced in its meaning: it contains a set of synchronized video segments constructed usually to create one meaningful whole. It can be thought that there these particular videos in the edit are *associated.*

5.3.2. Order and separation

Besides creating groups, one should be able to create ordered groups. Creating order (as opposed to consciously creating only groups) is a form of creating associations.

Also, association of a video with other videos implicitly separates them from the other videos. It should be possible for the users to segregate media with different meanings and in the case of informal archiving, *with different archival needs*, from each others. For example, videos archived only for a short time might be good to be able to separate somehow from the long-term archived ones. This is naturally also an issue of *placing* (chapter 5.1.), which means that groups can act as places media can be put.

5.4. Marking surfaces for digital videos

Context

Video needs to be marked for identification purposes.

Rationale

Videos and especially digital videos are signals, which means that the only marking surface they have by their nature is the signal itself. This is of course not feasible when creating archiving systems: new marking surfaces must be created.

Marking surfaces enable users of the system to create marks associated to the videos and thus project some meaning to them for the purposes of identification. Marking surfaces can be either unstructured or structured, depending of the purpose in which they should be used by the system and the users. Ie. rating information like the “5-star system” can be used to sort content meaningfully only if the users have contributed to it honestly. So, if the marking surfaces support only structured markings, like ratings, the conventions and practices of utilizing these markings should be known about.

Creating marks on the video content is creating *meaning* on a micro-level to that part of the collection. It works through embedding the markings on single items, as opposed to a catalog.

Principles

Design affordances for creating and modifying markings on and onto the video content. If structured markings are afforded by the system, awareness of the practice of utilizing them is needed in order to be able to design the system to support the markings properly.

Provide users the possibility to give structured and unstructured data: unstructured can be utilized by users to create workarounds, in case the system doesn't fit some particular need provided by the structured marking surfaces.

5.4.1. Describing video

In general, describing video using words is a complex task and it has a high risk of ending up totally wrong. Describing video with words is dependant of an individuals ability to create unstructured descriptions of audiovisual media so that it represents the content of the medium in a way which people comprehend. This has a lot to do with conventions. Also, the reason why rating systems exist in mass media is that they create an unambiguous additional meaning to the movies shown in theaters.

5.5. Sorting videos out

Context

Large collection of videos needs to be organized into meaningful parts.

Rationale

A large collection, with a variety of qualities of videos, genres and origins of video material begs to be organized. A common practice of organizing it, is to classify it. Classification requires a solid understanding of not only the whole collection, but the environment where the collection exists. Classfication systems are usually created, when there is a need to communicate about the subject matter across boundaries, or *move* the subject matter across boundaries. An example of this is the genre system of music and the birth of cross-over genres to describe the evolution in pop music in a way which can be communicated to the consumers.

Creating a classification system is a difficult task and it requires constant adaptation to have a working system. Classification enables macro-level organizing of an archive and can be used to provide information for useful overviews of the contents of the collection.

Principles

Give the possibility to create classes to which content can belong to.

Give the possibility to create a hierarchy of classes, ie. subclasses of classes, if the user happens to have an archive, which needs that type of organization.

In the case of an archive, which has material from multiple contexts, afford the possibility that the videos belong to multiple classes at the same time.

Make possible the continuous, feasible maintenance of the schema with tools that support decisions to be maked when maintaining the schema.

Affort the possibility to share the self-developed schema to others and use schemas developed and maintained by others, in case people don't want to develop a schema themselves.

5.5.1. Tags

Tags[24] are labels for content. Called also folksonomies, *folk classification,* tags support informal, flexible and multi-dimensional ways of classifying media. They are useful, when the content of the collection is mixed, it's boundaries are unclear, there are no experts classifying the collection items and the classification is not coordinated in a top-down way (Shirky 2003).

This makes tags suitable for dealing with the classification in an unexpected and changing world, instead of top-down, enforced schemas. Through maintenance of the tag collection and adjusting tags on the content, the classification system evolves and keeps pace with the changes in the media collection.

Tags can be used conveniently for providing users ways in which to filter a large media collection based on tags. This can be provided in a convenient tag cloud or other type of tag-based navigation.

5.5.2. Categories and naming

Libraries and archives have a tradition of organizing large corpuses of items based on taxonomies. And it works fine when we are dealing with independent, properly curated collections of media. Naming and classifying media is a way of appropriating media into the realm of a community: through using specific vocabularies to describe the media, a community builds it identity.

Taxonomies and other categorical, exclusive organizational schemas are infrastructures which are built in order to classify things so they can be identified easily. They require a lot of work to produce and should only be used in the case of well-established and preferably institution-related video archives.

5.6. Scenario: Family TV

I have created this three-part scenario to propose a system for a family to collect, cumulate and adapt its archive of audiovisual media *through video use.* The system then takes this use into account and adapts to the evolution of the archive through use.

The scenario is based on the principles described before and I will present, how they are used in creating this scenario. The scenario is a description of how a complex information system would work. It describes how different parts of the system, devices and applications operate together and how the activities and responsibilities are divided and delegated between the parts of the system: humans and different technological components. For example, user-interface details are not described in it. This type of reality is not so distant, it could easily be implemented today. P2P-Fusion project, hosted in the research group, explores this type of individual-centric ways of collecting and archiving personal media in a distributed network as opposed to the centralized media sharing services of today.

The scenario is inspired and informed by the following scenarios and conceptual designs produced in the Arki research group. The Kitchen Album by Lagomarsino (2004), which focused on sharing of cooking recipes made with video. The Cooking Community scenario, written by

[24] http://en.wikipedia.org/wiki/Tag_(metadata)

Kari-Hans Kommonen (2006), describes a platform for sharing and producing audiovisual media content. Andrea Botero Cabrera's video-chat cooking sessions with her mother connecting Finland and Colombia. The Kori application produced in the EnComPas project (2005), described in 3.2.

External influences are "Social Software for Set-top Boxes", a presentation by Tom Coates (2005) which describes a concept of integrating instant messaging features into interactive television, Family Scrapbook (Chelaru 2005) presented in chapter 2.2. and Narrowcasting TV presented in Mizutani (2006), a concept of a TV channel showing a slideshow of digital photos sent to the channel by family members with camera phones.

The main point of this scenario is to represent what role technology could play in people's everyday life, what requirements does the technology have from the users and the users from the technology. This kind of positive, people and everyday life centered scenario, the words used by Kommonen (2004), is needed to bring the aspect of practices in everyday life and their development to the discussion when developing concepts and visions for the future of technology.

5.6.1. Part I: Living at home

"Laura lives at home with her parents. She goes to the last grade of high school and is going to move to another city for studying for the next semester. In Laura's home they have a Family TV, which allows all the distributed members of the family to share and archive their personal videos to a distributed storage system. With Family TV users can share their watching information with other members of the family: what have they watched or recorded something from TV. It allows sharing and redistribution of those programs which the broadcasters have marked as sharable.

Laura has just arrived home from horse-riding with her friends. She recorded a video of her friend, Hanna, riding and Hanna recorded a video of Laura riding. Laura decides to add these to Family TV Channel. She uploads the videos from the camera phone to the Family TV system. During the upload the system presents icons of the two videos. They are accompanied by date and time information which was recorded in the camera. Laura decides to name them, as she still has to wait for the uploading to be completed. She gives give them the names "Laura's horse riding" and "Hanna rides".

The system announces that Laura has uploaded the videos to the Family TV channel and a view called "Recent" is shown. It lists the additions to the channel in a navigable timeline. Most recent videos are the one's which Hanna added, but then there is a video by Hanna's 10-year old cousin, called "Happy birthday Grandma!". There is an announcement, which says that the video is being downloaded from the system by Laura's grand parents Family TV system. "Here's my birthday present to grandma", Laura thinks. The grand parents' system is set up so, that they always download the videos which is added to the channel and also some of the programs which the younger members of the family watch from television.

Hanna decides to watch the video made by her cousin. After that she browses the Family TV Channel Guide, which has a listing of all the people or families who are members of their channel. There are short lists accompanying every name and household: which are the TV programs they have recently watched, recorded or are maybe watching right now. Listed are their both grand parents, her fathers both sisters families and her big brother who has already moved away from home. Her big brother is not usually interested in her horse videos, so she does not expect him to watch it. Though her brother has his own Family TV system, it seems that he doesn't share a lot

of his TV watching information to the family channel. Laura knows that he shares the info more with his friends.

Laura can now see from the system that her grand parents have downloaded the media on their hard drive. The system shows the number of copies that exist of each video and Laura's horse videos are now in her home's and her grandparents' system. Laura browses the grandparents' media and sees that they have stored almost all of the family's media on their hard drive, the earliest videos being copies of digitized super-8 films of their trips to the Canary Islands in the 1970s. Their other Family TV members usually also download the material from them to their own system storages."

The first part of the scenario introduces the basic functionalities of the system and the function it servers to those who use the system: it provides a place for the users to put their digital videos in so that they are 1) conveniently watched later, 2) shared with preferred people and 3) replicated for other users hard drives to create a distributed backup system and a safe place for family media (Design principle "Video needs a place to stay"). The scenario exploits the fact that there are strong incentives for families to preserve and document their activities during the years and for people to continuously rebuild their identities in continuum to their own and family's past.

The scenario hints also at the idea how the system takes its use into account (Design principle "Using is archiving and organizing"): it is adapted through its use, through recording the user activity to a database and using the data to make the system's use transparent to other users. Erickson (2003) claims that for systems to support social activity, their use has to be made transparent to other users and everybody must see the same thing without any interpretation made by the system in between. The Family TV Channel Guide represents this aspect of Erickson's suggestion. Forcing the time-dimension to be the lowest level of organizing the videos creates entropy into the system and a sense of history. As the activities are stored they can also be traced back for many years and support not only reminiscence but personal recollection of events in general in a certain time.

Finally, the system affords simple written descriptions to be added to them (Design principle "Marking surfaces for digital videos"). This creates one additional layer of meaning and an input to the video archive that only a *human* can give. It creates an extra handle to the content, one more way which people can be used to discuss and refer to the media and also to find the media in the archive.

5.6.2. Part II: Independence

"*Laura has moved to study in a new city. It is the first time she lives alone and away from home. At her home she now has her own Family TV, which she uses to stay in contact with her relatives. Since she moved away from her home, she has taken only a few childhood videos with her from the system owned by her parents: some when the whole family still was still living together and no one had moved on their own yet.*

Daily, Laura keeps in touch with her friends through sharing each other's lives with photos and videos with the application that allows her to use Family TV. She also uses the same application to watch study material, as she's often studying also at home. The user-interface can conveniently switch between family, study and friend modes, so that media created in specific contexts isn't represented in a wrong context or situation.

She's now starting to prepare for an examination next week. She was sick last week so she missed two lectures. She opens the Study mode, where she switches to the Tag Browser in the system and selects the tag "Contemporary Finnish Youth Cultures". Her system has automatically downloaded all the lecture videos from the courses to her hard drive based on a subscription she made to the lecture's video feed. Selecting the lists out only videos from the course: the tag filters out everything which isn't tagged with the exact tag, for example all the silly horse riding videos from her childhood from the Family TV archives. She then watches the course video and her system records her doing so. The system also notifies the course's communication channel that Laura's watched the lectures in question.

After she's watched the lectures she doesn't feel like sitting in front of the television anymore and goes out for a walk. When she returns from the walk, she wants to watch a movie. She checks out if anyone of her friends has recommended anything worth watching: no recommendations there. Her brothers, who are a bit older than she is, haven't been using Family TV that much lately, or at least they haven't been sharing and watching any family videos.

However, her younger big brother, Pete, always shares his TV watching information to the family channel. Hanna checks what Pete's been watching and notices, that Pete is watching something right now, something called "Sand Bugs". She checks out the film's Info Sheet, which contains data that instantly downloaded from the International Film Database. It seems to be a sci-fi comedy based on the cast, Hanna thinks. Hanna switches to watch the same movie and Pete is sent an announcement, that Hanna is watching it too. Now the family archive has a logging of them watching TV remotely together. During an advertisement break in the film, Hanna tags the film using tags "science fiction, Pete, action film", as she doesn't like action films that much. But it is fun to share the moment with her brother.

Before Hanna goes to sleep, she empties her mobile from past two days media. Yesterday she accidentally happened to walk in the scene of protest where there were street artists performing with the protesters. She makes a group into the system for three videos which she shot of the artists and the protesters. This grouping of videos is displayed as a separate entity in her own collection, for her to easily find all the videos. She decides to put the group into Family TV without naming it and sees that Pete, her brother's machine starts to download the group of videos into his system to watch. She knows that Pete has had to check out what the videos are, as she didn't describe them in any way: the only thing which was visible on the channel was that she has added a group of videos to the Family TV archive.

The second scenario shows more of the video watching and accessing experience of Family TV. The system comprehends every collection of videos as an archive which need permissions to access. Every action of using the system is published like the user prefers it to happen. Again the feature of "social translucence" regarding activities is present, which enables people to coordinate their actions based on what others are doing and how the media collection is organized (Erickson et. al 1999). This builds on the design principle "Using is archiving and organizing".

When the diversity of media to be possible and manageable on user's attentions behalf, every media must be able to exist in a *specific context* of the system. I used the word mode to describe the possibility to switch modes when browsing and accessing the archive. Chalfen (1997) in his studies on Japanese home photography, talks about Japanese have a "home mode" how they use photographs: it has sophisticated characteristics of privacy (no pictures of people from the family collection are on display at home) and context (home pictures have very different qualities than work pictures).

When the amount of media increases and the same production and consumption tools are available and used in a diversity of contexts, there must be intelligent and sensible ways in which to control what media is accessed and seen. In the scenario, Family TV has some sort of tagging system in which Laura uses a tag unique to the school lectures to filter out everything else from the collection. It works naturally the other way around, but this requires a certain degree of externalization of the contextual information in the form of names or tags or other information on the content. Tags and other informal ways of classifying content, are especially useful, when new videos from new contexts can appear any moment (Design principle "Sorting videos out").

When in the modern society family members are migrated apart from each other, they need ways in which to keep in touch and "preserve the family legacy". Family TV can act as a place in which this can happen, through continuous recreation of the family's media archives and sharing of experiences. (Design principle "Video needs a place to stay")

In the field study's introspection part (Ch. 3.1.1.) I presented a collection of movie tickets. Based on an intuition of reflecting on the set of items, I would say that the watching data of movies is meaningful and has a certain sentimental value to the people who have been part of the event. As commercial movies can probably never be owned and copies of them shared systematically by ordinary people, we can at least store a "ticket", a digital trace of this ephemeral event to our media use logs. Maybe this can be used later to filter out bad experiences of watching bad quality movies again, after having forgotten all about them. (Design principle "Use is archiving and organizing")

5.6.3. Part III: Changes in family

"Laura is living together with her boyfriend, Tom, in their apartment. They've lived together for a few years and have recently gotten are engaged. They have now a shared Family TV. When they met, they gradually showed parts of their histories and families to each other, exposing each others and their close ones' past and present moments to each other to get to know one another better. Now they expose their everyday mediated life and life histories completely to each other and trust each other in that.

They have agreed to use shared interface, now identifying themselves as a couple, a small family of their own which is part of the bigger families. They suddenly both are exposed to large amounts of family media of other people who they don't know at all, so they watch it selectively and with the guidance of the other person who can explain the contexts for the media. However, as it is a shared system, they want to have a way of having a space of their own. They both have set up groups and declared some tags into their personal use so that they can easily access their own media.

Laura's parents have recently retired and they are now living an active life, spending lot of the time in their summer cabin. They have bought a new system with a very large hard disk, to the summer cabin. They use it to store every video on the Family TV in one more copy, just in case their house burns down.

This sudden worry about the preservation of the archive videos exists because her grandmother died recently and her grandfather, who is still alive and a very grumpy old man, was never too interested in videos and TV. This meant that the history stored in video form and its keeping had to be renegotiated with the living members of the family.

Much of the responsibility for keeping the media was taken by Laura's parents and her siblings.

Finally, all of the videos in which her grandmother was in, were deposited to a national digital citizens archive, a public service, which preserves the digital memories of people who pass away. During the process the videos are transformed into a digital estate by the family, which means that an extra layer of metadata is added to the media, in a way suitable for someone who has passed on. The videos were categorized according to different stages in her grandmother's life. They formed categories of all the places where she had been in the videos, from geographical data to street addresses, cities and countries and connected the places to the time dimension. In the end they gave different names for different periods of her life in the spirit of "Baby Years", "Early childhood", "Engaged", "Mother of one", "Mother of two", "Working in Helsinki" and "Retirement years".

This last part of the scenario presents how changes in human lives influence a shared media archive. It illustrates this first through the bringing together of two families and how the couple has to negotiate the boundaries of their own collections and transform their collection from two collections into one collection, a collection of the shared household. When the families open up for two people, there will be an issue of scaling that has to be dealt with. They simply cannot have a twice as big collection of audiovisual media, no matter how distributed it is. So, the limits of the collection and who are taking part in collecting stuff into it, have to be negotiated and this has to happen in the items of the collection but also the classification systems used to describe the collection (Design principles "Sorting videos out" and "Video needs a place to stay")

The other change is when Laura's grandmother has passed away. This means, that the ownership and possession of her digital media has to be negotiated. In this case, luckily, there is a communal backup system which has taken care of the media. And there is also a place, where her media will be translated into using a formal schema, fitting to structure a human life (Design principle "Sorting videos out"). It is interesting to think about what will happen to human's digital media when they die? Does someone want to keep my favorite file from my childhood? Will there be some sorts of new rituals evolving like the archiving of the deceased person's media in the scenario?

I have looked at what happens in a community using such a system when there is a human and/or technological breakdown. Backups are provided as a user incentive to use the system, as it through using it, distributes the media into the network. The network can recover from the breakdown, but it will certainly have limits to what extent it can work again as it will never be the same, but different.

Finally, an important aspect in this scenario is the aspect of *scaling.* The system and the distributed archives scale when more and more members are added to it. However, this leads into eventually an exponential growth in the amount of media stored in people's storages: there needs to be some mechanisms for a) monitoring the amount of media on the storage and b) ways in which to decide, what to keep and keep the system clean.

5.7. Summary

I have presented a set of design principles to direct the development of possible, future media applications for digital video which have an element of keeping media in them.

The Family TV scenario illustrates a design opportunity for a combined family media archive and an evolutionary "TV channel". It represents a novel solution which builds upon the increases and growing affordability of local storage capability and personal bandwidth. It integrates archiving into video use, into the act of television watching

Preserving and archiving digital media is not only a task for individuals but for communities also. Families are informal “memory organizations”, which have the incentive to preserve the family history and keep in touch through sharing everyday media with each member of the family. Combining the functionality of a distributed, replicating archive and a TV channel, which is only accessible to the family members, a *place* for family to put their own media is born: the needs and practices of communal video watching and preserving family media are taken into account. Also, the Family TV is a concept, which utilizes the already existing practices of watching television.

As identified also by Lagomarsino (2004) in Kitchen Album, families have an incentive to stay together, when parts of them migrate away from home and around the world. Media sharing and shared watching experiences bring a sense of communion and enforce the family ties. A family can be considered as a distributed memory organization, which is constantly evolving as the family members change and their situations in life change. These type of media solutions can create a sense of security in the changing world, a place of preservation.

The idea is that the videos in the Family TV collection are organized through their use. This way the videos in the archive are used and at the same time maintained and the organization of the content is adapted to suit the needs of people, as the system records the traces of its use.

Preserving family media and creating backups and replicating the personal media to other family members’ storage solutions is a definite need for people in their everyday life. However, a systematic backup system cannot be organized by the application but it is more a matter of coordination and communication amidst the users. No technology can solve the unwillingness of humans to preserve their audiovisual media. However, an application like Family TV could easily take care of logging the creation of backups and recording who has taken the backup, when it is done and where they are located. The possibility to perform distributed backups can increase the trust into the technology and make it easier to accept into use.

However, if solutions like this would be available, their feasibility is suddenly a social issue. Person’s who don’t have the social safety-net surrounding them in the real life, wouldn’t have that in the digital realm either. Or if their health or wealth does not allow them to benefit from the communal aspects of shared media archiving.

6. CONCLUSIONS AND DISCUSSION

It is generally agreed that archiving and preservation of digital information cannot be done by the machine alone but requires human work in order to be successful. In the thesis I have suggested that through assessing and redefining how the responsibilities between humans and machines are divided, or better yet, *delegated*[25], we can achieve new directions for designing and developing ways to archive and organize digital media.

With the help of video prototypes, I have explored this phenomenon of "delegation" with several scenarios and design ideas. These prototypes proved to be a particularly useful tool in creating a feasible representation of that specific phenomenon. I have proposed a definition for the practice of informal archiving (of digital video), and how it can inform and bring new focuses for the development of systems for preserving and archiving digital media materials.

This goal has been achieved through a design research project that worked with different media and tried to develop ways in which to carry out the work. The process has consisted of translations from the idea to hypothesis to a review of related work, from the introspection to a home interview to a video prototype, and from a practice to design principles to a scenario and finally into a thesis.

The understanding and exploration of the practice were condensed in a proposed set of design principles "Video needs a place to stay", "Using is archiving and organizing", "These videos belong together", "Marking surfaces for digital video" and "Sorting videos out". They are based on the research on related work and the design exploration consisting of the field study and building of video prototypes.

Kapor (1991) has argued, that in the cases of digital technologies, the application and media design activity has often the role of mere interface design. He has criticized that this is not sufficient, as the tradition of design takes responsibility of the overall quality and workings of the end result, in the spirit of an architect in the case of buildings. Bricklin (2004) suggests that designing and implementing systems coming to use in everyday life, should be an activity requiring a certification: one should have some type of certification or permit, to be allowed to design software systems for people, just like architects or civil engineers have when they construct and design buildings or environments.

In this research thesis I have attempted to follow a 'design approach', which leads to the creation of artifacts as a central line of action. The project contains many different ways of translating knowledge into an artifact and then using the artifact to create new knowledge. As the nature of translation projects in general, some information is lost during the translation. That is why I have attempted to make the translations as visible as I can. As design produces local, embodied knowledge I claim to provide only informed opinions or sophisticated guesses. The thoughts, ideas and observations, which are presented in this work, I don't claim as objective, but as situated and partial truths (Suchman 2002).

However, at times I have found the project problematic, as I am not a software designer and thus my design material has not been a software but more the interactions between technology and humans. Ehn (2004) has discussed the discipline of interaction design, where the design activity focuses on the relationship and interactions between technology and humans. My approach is between Ehn's ideas about interaction design and Kapor's arguments for the need of software

[25] Chipchase (2006) names 'art of delegation' to describe how responsibility can be sophistically delegated among people and ICTs.

design. I have focused on comprehending and redefining the relationship between humans and information technology. This focus has lead me to make many observations, and propose some ideas on how digital media organization should be approached in order to make it more feasible for people to use. At the same time I have also recognize the principles for developing personal ways of organizing media and appropriating the system to suit the ever changing practices of individuals.

6.1. Ethical considerations in digital media archiving[26]

This thesis has identified that archiving is an infrastructure for media use. However, infrastructures must be developed and maintained to fit their environment. They can be expensive and demand a lot of resources (Bowker and Star 1996). Who should own and control this infrastructure, who has the obligation to invest money into it, and what are ethically acceptable motives for this?

The developments concerning digital preservation and archival systems have traditionally been in the ownership of memory organizations like libraries, museums and archives; independent or embedded often into companies and public institutions.[27] Over the years, these institutions have carried out massive technology research and development projects, and standardization attempts. These activities have focused on the ways in which the institutions can cope with the development of ICTs, maintain their competitive edge, and justify their existence in the changing world.

The above mentioned institutional developments have relied on the existence of domain experts, i.e. educated expertise, for making strategic and informed decisions in digital preservation and archiving. This expertise *is not available* for the everyday individuals who create and use digital data and media on a daily basis. The institutions can also dedicate more time (and technologies) to finding methods of archiving, maintaining and organizing their data. Moreover product development and research funding is directed into developing products and knowledge to suit the needs of already existing institutions, and they develop mostly expensive and proprietary solutions for digital archiving and preservation. This development does not acknowledge or even consider the possibility that personal digital archives would be significant, powerful solutions for archiving digital data in the future, as suggested by Beagrie (2005).

The biggest challenge in this everyday archiving is the difficulty of making the decision to keep something. This decision cannot be made by technologies, but by people (Jones 2004). A constantly cumulating digital media archive where nothing is thrown away leads to a chaos unless sophisticated and feasible ways for organizing and archiving the personal media are developed. A problem can arise when these *key ways* of organizing and archiving media are owned by someone and are not considered as a public utility or available to be implemented into nonproprietary systems.

Another challenge arises when managing and organizing media archives creates huge amounts of metadata and collection data. This metadata and collection data is often tied to the specific software application or service. Even if the users of the product or service created it, people have difficulties in exporting the created metadata to other applications or services, thus creating

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[26] This chapter is partly based on the work done in Botero Cabrera and Tikkanen (2005).

[27] In the cases of personal media, there has been discussion about the role of these archives and the institutions, in preserving also personal media (Beagrie 2005, Marshall 2005)

a user lock-in situation. This is a situation, when the user has difficulty in transferring the personal metadata to another application because it takes an unreasonable amount of work to move the media to another system. This leads to the question that should there be regulation, which would make it easier to move from a media collection application to another? Should there be standards to describe the collection content in case of that kind of situations? It will be interesting to see, if the future will bring some type of regulation to the way the organizational and archival data of media collections has to be available.

6.2. Future work

The validation and refinement of the design principles which I have presented in chapter 5 is the next step when proceeding with research on how organizing digital media happens in everyday life. The validation can be easily done through creating system prototypes, which first employ no organization and archiving possibilities at all, and then one by one, adding different levels of organization and archiving possibilities to the system with a bottom-up approach. The knowledge from these experiments can be then used to refine the principles.

This work has focused on the idea of video as the central (and only) *media* element. This was a conscious decision to have a small-enough scope for the work to be able to complete it in a reasonable time. However the reality in which people operate today has multiple, interconnected media: text, images, audio, video and interactive media elements are used fluently together. This study is biased, as it does not look at the whole spectrum of the media and data that people are today preserving and archiving. Moreover it does not assess the challenges arising from the hybrid nature of that type of collection.

A challenge of its own would be to make a study on how media is translated and in particular, how metadata is translated, when it is moved from a community to another or across the boundary between private and public. And in the same study, an account on what qualifies as a lock-in situation in these cases, should be delivered. The emotional connections and feelings resulting from personal contributions to make digital data better organized, need to be researched and there is no critical studies being made about it at the moment. It could bring important understanding when making decisions about how a society should deal with archiving and organizing personal digital media.

If the hypothetical project would be unbiased enough, ie. there would be a variety of different strategies to approach the problem, it could lead to better understanding of the role played by classification and descriptive metadata when going across boundaries. These transformations and translations already take place, since the digital video production is not anymore the privilege of the media industry.

Finally, this work does not deal with the feasibility of long-term personal video and media archiving. There should be a separate study exploring the solutions for this. In the other hand, a study could explore the ability of public institutions or private corporations to provide these products or services for the users. These studies should research the current media archiving practices of individuals, families, groups of people (f.ex. friends), communities, non-profits and other small organizations.

It is worth considering is that the society has not yet established who shall preserve the digital data through the human generations. Kuny (1997) has called our time the ‘digital dark ages’- not very flattering label for the information society! The questions that need solving: should there be citizen archives for digital data? Is our digital data archiving in the future in control and outsourced to corporations or can we deal with the data ourselves? Hopefully the solutions will

be unique for each individual: some will pay for a service to preserve and organize their media collections for them and some will find out how to do it for themselves and their close ones. To me it seems, that neither of these development can exist without the other and both of them will surely see socially, technically and economically feasible solutions emerging in the next ten years.

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Video Archive Catalog

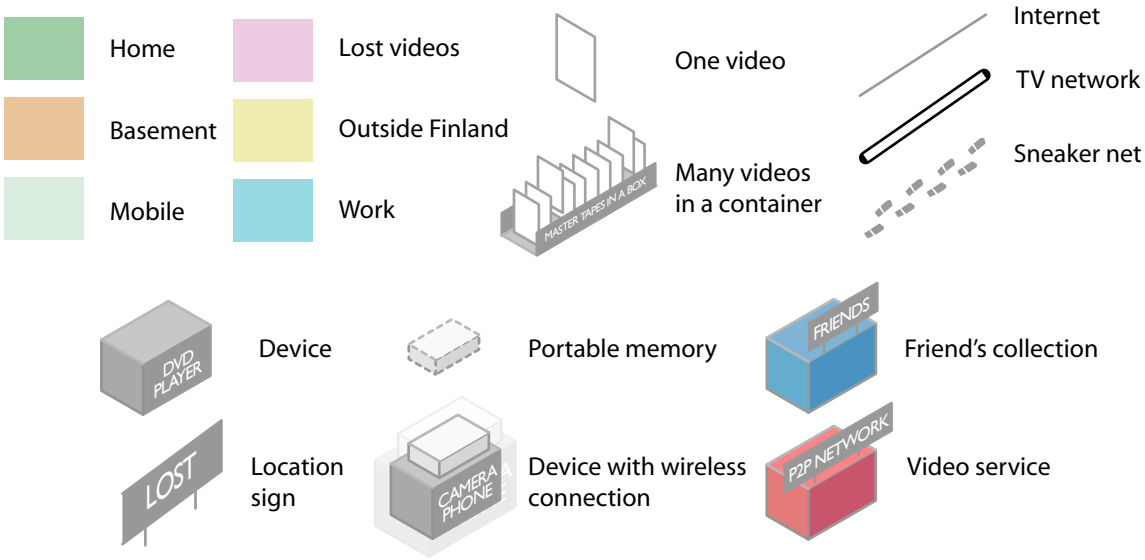
Appendix A

Introduction

This is a report written about a field study into the personal video collections of six individuals. The purpose of this study is to inform and inspire a larger design research project which investigates the practices and challenges of personal use of video material and technologies, especially focusing on how people archive and keep audiovisual media materials. The focus was on finding out the different uses of the video materials and the technologies people have and what roles do they play in their life.

The report presents the observed materiality of six personal video collections, in a very straight-forward manner. It contains photographs of each of the items or set of items, which were discussed and looked at during the visits to people's homes. In two cases exemplary screenshots of video collections which are 100% digital and stored on a hard disk of a computer, are included. In connection to each visit, there is also a brief summary of the discussion and a "schematic" of the video collection. The summary includes some observations which have been made from the particular collection and the interview.

Map legend



Floor colors (upper left corner) signify the place, where the devices and the videos are. Different networks are presented in different ways, some networks are not part of this legend but annotated to the schematic. Every place has a sign, which gives the place a name.

John's collection: Summary

John is a 28 year-old professional game developer and student of New Media. At the time of the interview he was living with his girlfriend in in Arabianranta, Helsinki in a one bedroom, kitchen and livingroom apartment.

LIVING ROOM, TV AND VIDEOS

John keeps most of the videos he has acquired in their living room's bookshelf. They are all on open shelves and it can be easily seen, what the collection contains (1). The collection consists of a few groups of DVDs, some grouped by their packaging and similar contents (2), some into a general category of commercial DVDs (3,4). One shelf contains a book, a software application and a VHS tape (5) of a Rolling Stones concert, which he has bought himself and wants to preserve (6).

They have their VHS tape recorder conveniently under the television set with a few tapes. The tapes are used for time-shifting, ie. recording television programs, which are shown at the time when they are not in front of the TV (7). An interesting feature of the setup is a DVD casing that hides a bright blue light on the appliance and prevents the light from getting into the spectators eyes.

John and his girlfriend have quite recently moved to this apartment and are still amidst throwing old stuff out. John shows a collection of CD copies of movies he has downloaded from the Internet (8). The collection is now in a plastic bag waiting to be disposed with other household trash.

A DESK AND A COMPUTER + WEBCAM VIDEO

They have a desk in the living room. In the desk's drawer, John has a few MiniDV tapes (9). The tapes are not marked in any way and they contain some material for a presentation video done at work. On the table, John also keeps his laptop which he carries between his home and work. In the laptop, he stores videos into the computer's file system into folders named specifically for the purpose (10). For example, he has one folder for videos which he downloads from the Internet (Screenshot 2). If he wants to preserve some of them, he burns them on a CD or a DVD (8).

He occasionally shoots video with his digital still camera and uses a flash memory card to store them and transfer them using a card reader into his laptop (11). He accesses these videos also from the file system and uses the laptop to watch these videos (12). Because the files, ie. the images and the videos are transferred from the camera to the PC on the same time, the still images and videos will always be located in the same directory on the PC hard drive. He has given the files names which include the date and place or name of event in the video, so that it is easy to sort them and find the right videos. He has not given any names for the photos or videos and says that he remembers them more by the location in the folder structure (Screenshots 1 & 3). He and his girlfriend have also created a video with a webcam for his smaller sister for her birthday. This he keeps in one of the folders.

BACKUPS AND SAFE-KEEPING

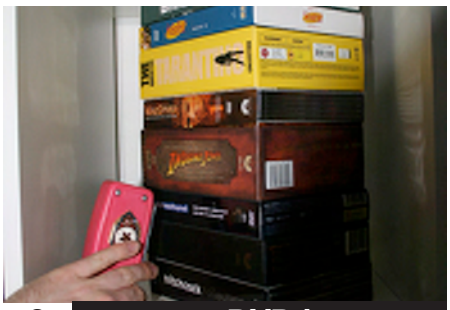
In another drawer of the desk. he has a collection of his old hard-drives (13). He says, he has moved all the critical data to backup drives, but the drives still might contain something valuable, so he is keeping them to make sure not to lose anything important.

He uses CD's and DVD's for creating backups of the photos and videos he shoots himself. He keeps the discs in a plastic box on the desk in the livingroom (14). Before, he used CDs for the backups, and now he uses DVDs. He is still in the middle of process of moving his old things from the CDs to a fewer number of DVDs. He does not have any extra backups of the data anywhere, just the ones he has in this box.

They also keep a collection of old VHS recordings from TV in a cardboard box in the basement behind a locked cage door (15). They do this because they don't want to have them in their home taking space. The tapes are in a box and some of them have written texts on them, which have been corrected many times. The markings on the cassette are probably untrue, says John. The box contains also other media, like computer games and data on CDs. (16-18)

John's collection: Photos

1 Bookshelf, collection



2 DVD box sets

3 Commercial DVDs

4 Commercial DVDs

5 Video, text, software

6 Rolling Stones VHS

7 VHS under TV, tapes

8 CD copies of movies

9 MiniDV tapes, drawer

10 Laptop, directory

11 Flash memory

12 Video on the laptop

13 Hard drives, drawer

14 Backups on CD&DVD

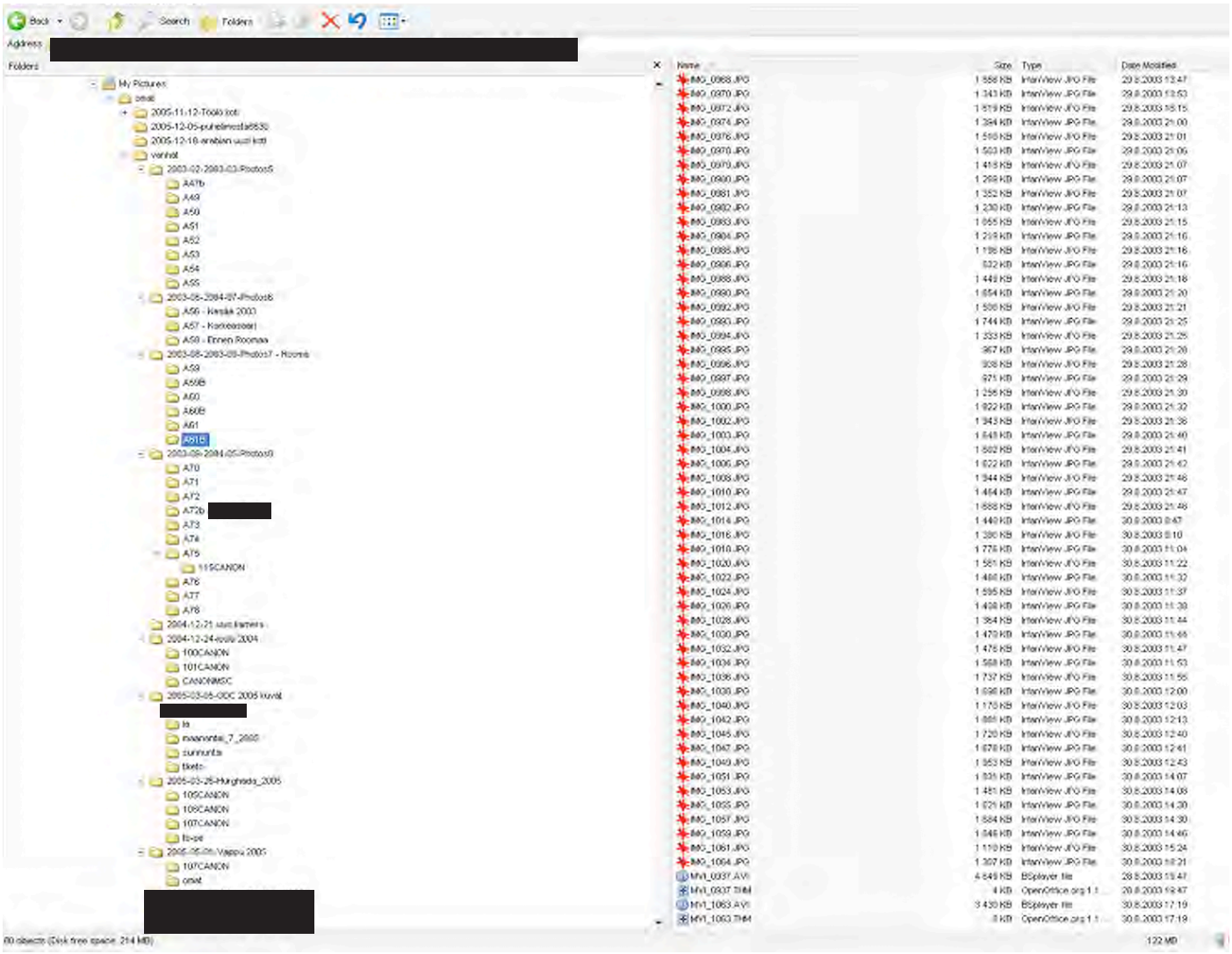
15 Basement

John’s collection: Photos & screenshots

16 Box, mixed media

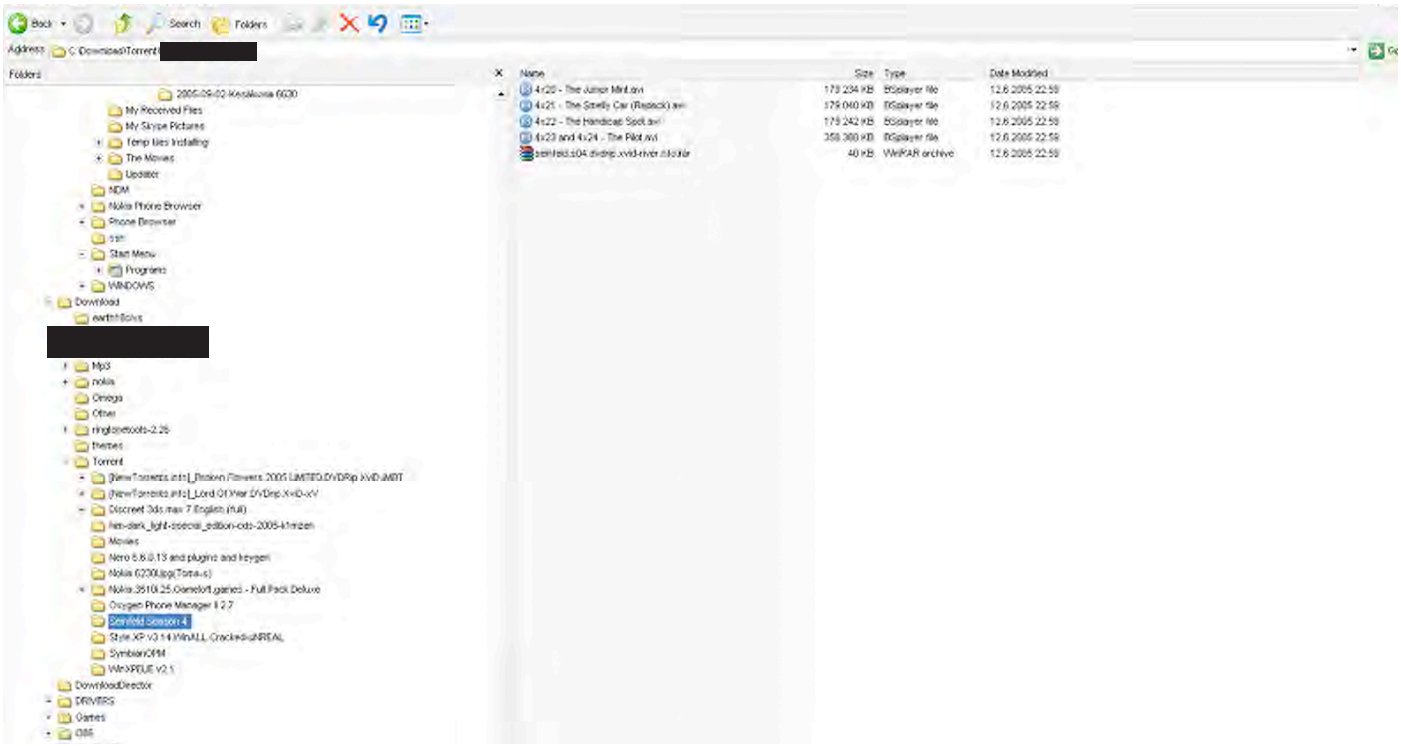
17 VHS tapes

18 VHS tape, recording

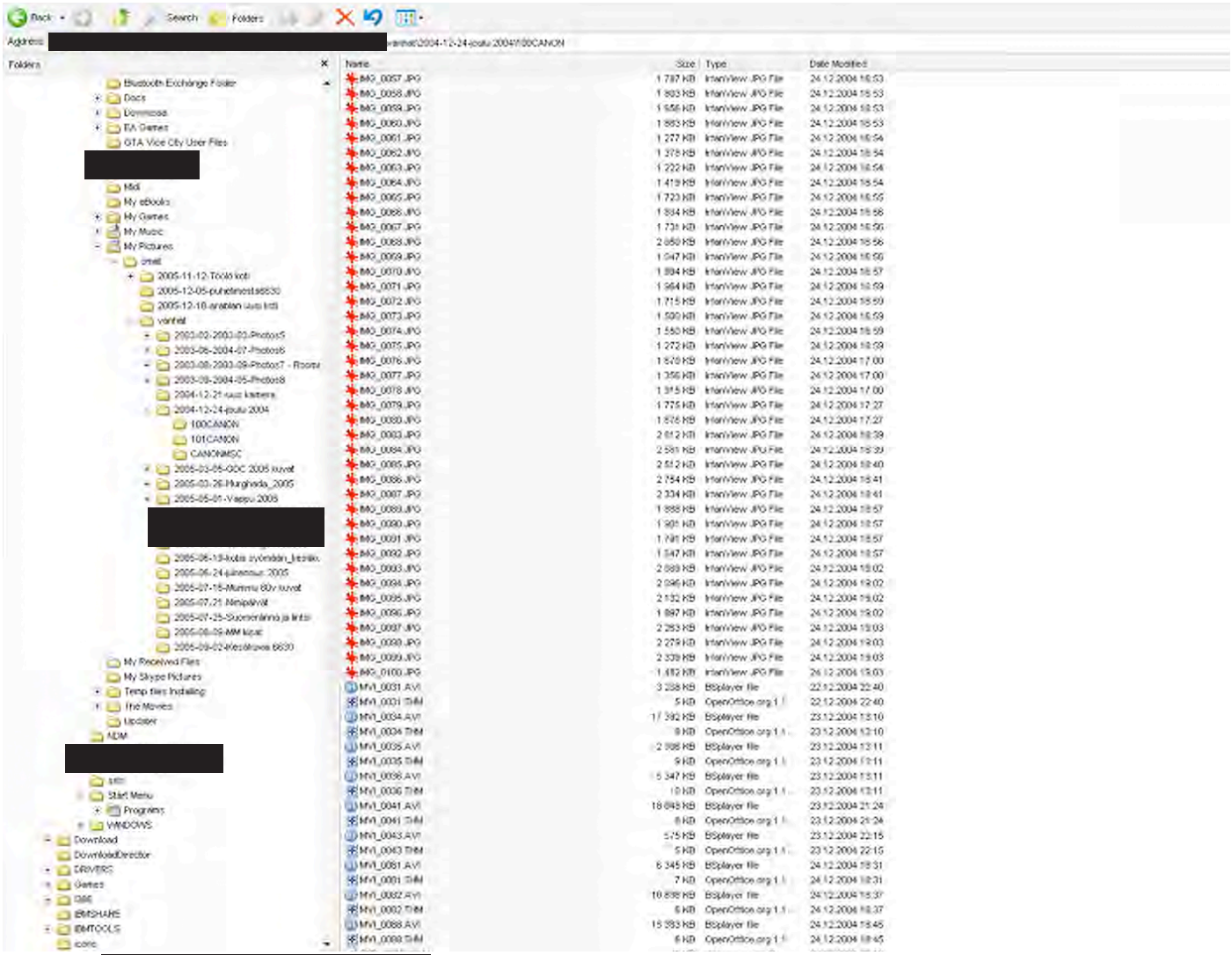


S1 Directory in the laptop

John’s collection: Screenshots

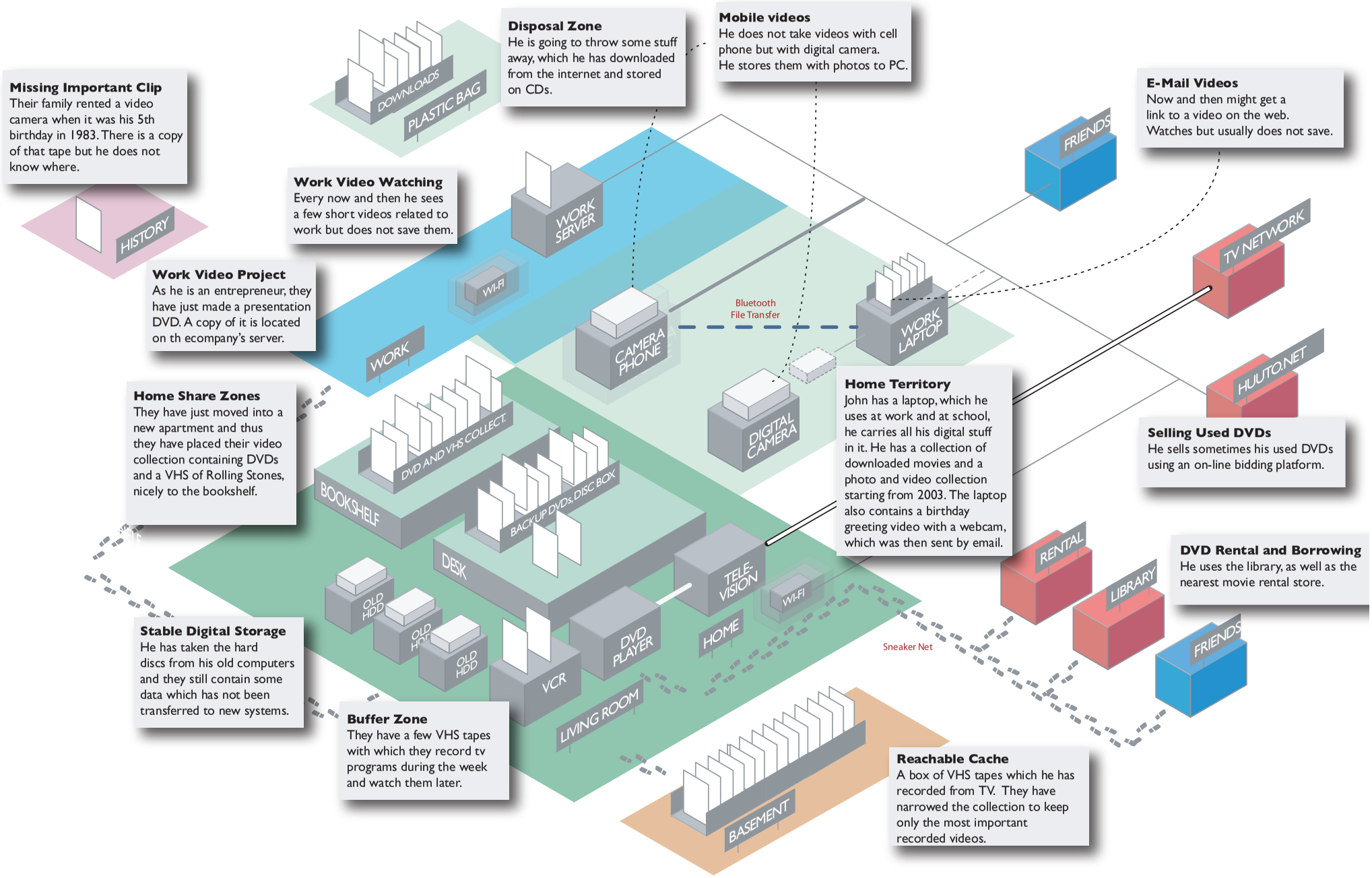


S2 [redacted] Downloaded movies



S3 [redacted] Directory in the laptop

John's collection: Map



Lisa's collection: Summary

Lisa is a 30+ year-old Lebanese researcher. At the time of the interview she was living with her Finnish husband in Kruununhaka, Helsinki, in a one bedroom, one living room and kitchen apartment.

TELEVISION, VIDEOS, BOOKSHELF

Lisa and her husband keep their reasonably small collection of DVDs and video tapes in their livingroom, in the bookshelf next to the television (20). In the video collection one finds different kinds of video items, which are maybe more personal than the other interviewees had. There is a VHS tape of a coctail party after their wedding, with a hand-written title and a date on the sticker (21). In the same shelf, there is a historical DVD, which Lisa's mother has sent to her from Lebanon (22). There is also a DVD, which contains movies created by her husband's friend (23), a VHS tape of their wedding (24) and a Lebanese movie which her father has sent from Lebanon (25). In front of the television set, they have a DVD recorder with which Lisa records some TV shows (26) and a DVD box set of a TV series, which they are in the middle of watching at the moment (27).

SAFE PLACE IN THE SMALL BOX

In their bedroom, Lisa has a small box which contains important videos on MiniDV tapes and some MiniDisc audio recordings (27). In the box, she has a number of tapes, which are labeled with handwritten stickers or paper slipnotes (28). The tapes have a recording of a trip into United States. She's planning to edit the video recordings on the tapes into a road movie (29).

Lisa's collection: Photos

20 Bookshelf, collection

21 Wedding video, VHS

22 Historical DVD

23 Friend's DVD

24 Wedding video, VHS

25 Lebanese movie DVD

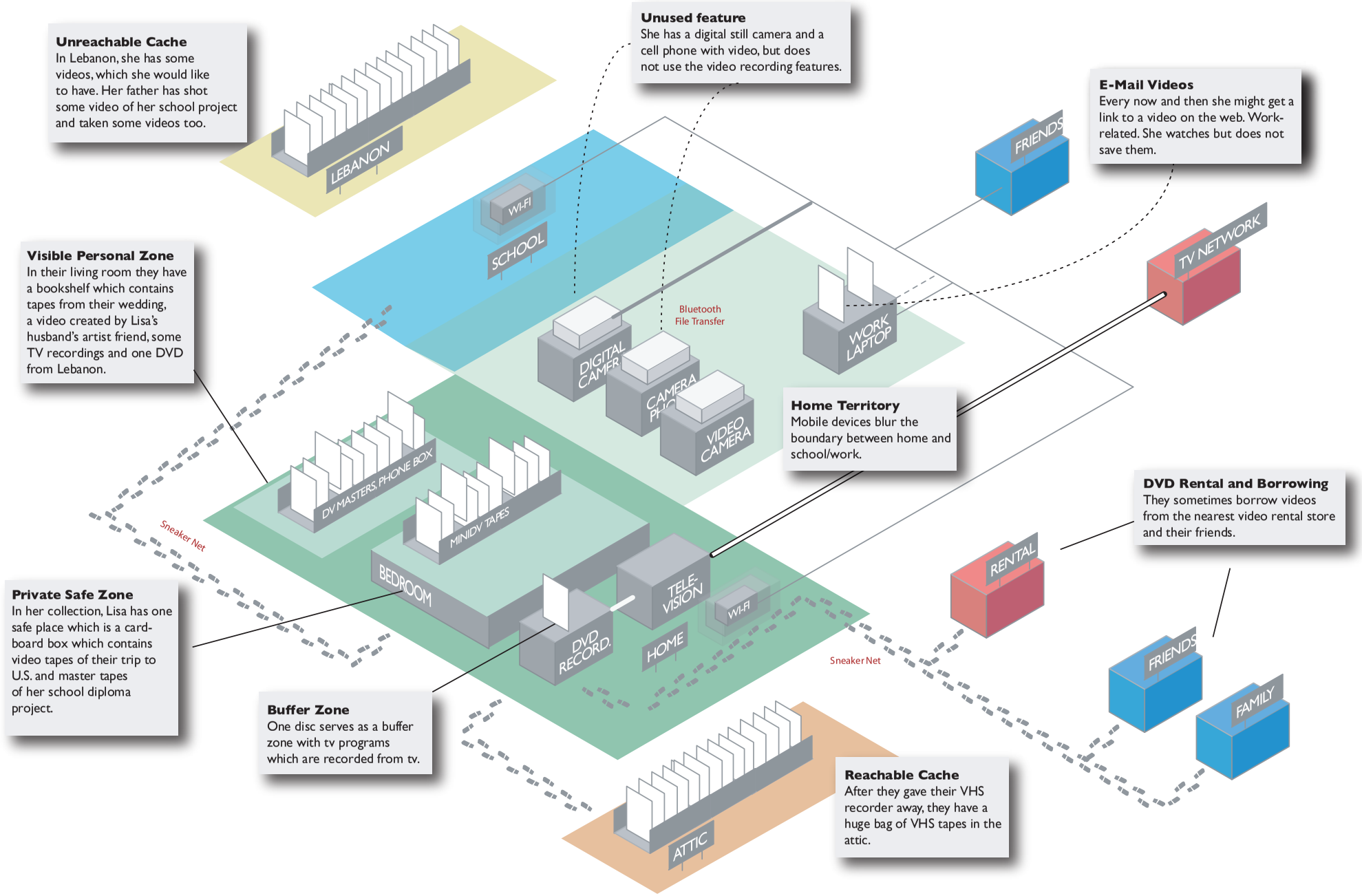
26 DVD box & DVD-R

27 Box with tapes, discs

28 MiniDV tapes in a box

29 MiniDV tape, markings

Lisa's collection: Map



Leo’s collection: Summary

Leo is a 28 year-old software designer and student of New Media and Computer Science. At the time of the interview he was living with his girlfriend in in Kumpula, Helsinki.

TELEVISION + VIDEOS IN A SHELF

Leo and her girfriend have a TV set with videos in the living room. The TV is located in a bookshelf. There is a VHS recorder+DVD player combo under it (30) which is connected to the stereo system and TV. Under the recorder there is a bookshelf which contains VHS tapes, DVDs and the board game of Monopoly (31).

TAPES AND DISCS

The collection of tapes and discs is threefold: There is the stack of commercial DVDs (32), VHS tapes in the back row contain material which are preserved for various reasons (33), and then there is the time-shift collection next to the recorder, which contains recent recordings (34). Some have already been watched and some not.

The commercial collection includes a set of VHS tapes and DVDs. As the DVDs are used more often, they are stored in the front fo the VHS tapes. The DVD collection contains a Stanley Kubrick box set plus a small collection of DVDs with two Polish movies (45), which have been acquired into the collection by Leo’s girlfriend. The commercial VHS collection contains one box set (42) and a few VHS tapes (41, 42, 44).

In their self-recorded VHS collection, they have marked the tapes using hand-writing on stickers. If the sticker has been torn off, the torn parts are replaced with pieces of paper (38). There is one VHS tape on which Leo has recorded Akira Kurosawa’s movie Ikiru (39). He says, that it was recorded over ten years ago and he has seldomly watched the movie since. But originally when he saw the movie, he liked it, and thought that he wants to have it available. Not all of the tapes have markings on them (43).

Their VHS tape collection contains the following material: a VHS tape labeled Bowie, containing something by David Bowie (48), a friend’s video project, a live concert, a nature documentary, Leo’s own movie project and a couple of recorded and preserved movies (46, 47).

BLUE STORAGE BOX

Under the bookshelf they have a blue cardboard box, which contains Leo’s random digital media material (35). There are MiniDV tapes and data CDs (36). Leo does not know what is in the MiniDV tapes. He suspects that they are working tapes of some projects which he did while working in a student TV station (37). The box contains also a mysterious 8mm video tape which Leo doesn’t remember or know anything of (49).

FILE COLLECTION IN THE PC

Leo has a collection of video files on his PC. He has downloaded a collection of animations from his childhood from the Internet, from a P2P network. He has stored them in a folder, having the series’ name in the folder. The folders contain the original archives, which are easier to move. In addition the folders contain the unpacked files of the series (Screenshot 4).

As he is doing a diploma work dealing with animation technology, he needs to have reference material for the thesis and also material to learn from. He has downloaded a large collection of animations, hand drawn anime, Disney animations and 3d animations from Pixar. He keeps them in one folder to locate them easily (Screenshot 5). He says, that he checks first if the animation he wants to see is available in a video rental or the public library. If it’s not available and he really needs to have it, he downloads the file to himself but does not redistribute it.

Leo’s collection: Photos

30 Bookshelf, under TV

31 VHS, DVD, Monopoly

32 Commercial DVDs

33 Backrow, VHS tapes

34 Tape next to recorder

35 Blue box of stuff

36 MiniDV tapes, CD-Rs

37 MiniDV tapes in a box

38 Custom “sticker”

39 VHS tape with writing

40 VHS tapes

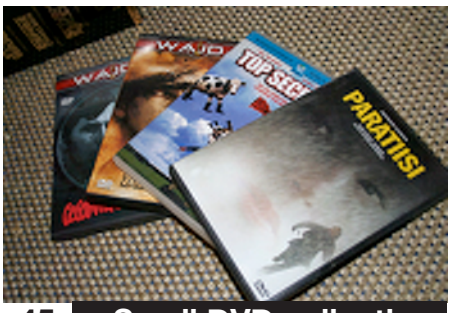
41 Tuvalu, bought VHS

42 VHS tape and box set

43 VHS tape 2

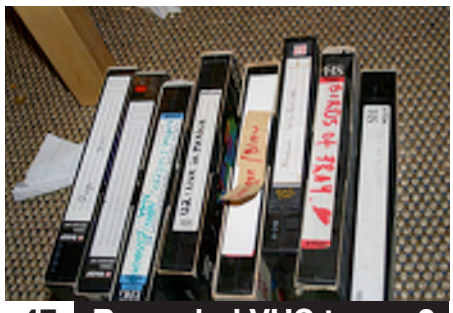
44 Bought VHS tapes

Leo’s collection: Photos and screenshots



45 Small DVD collection

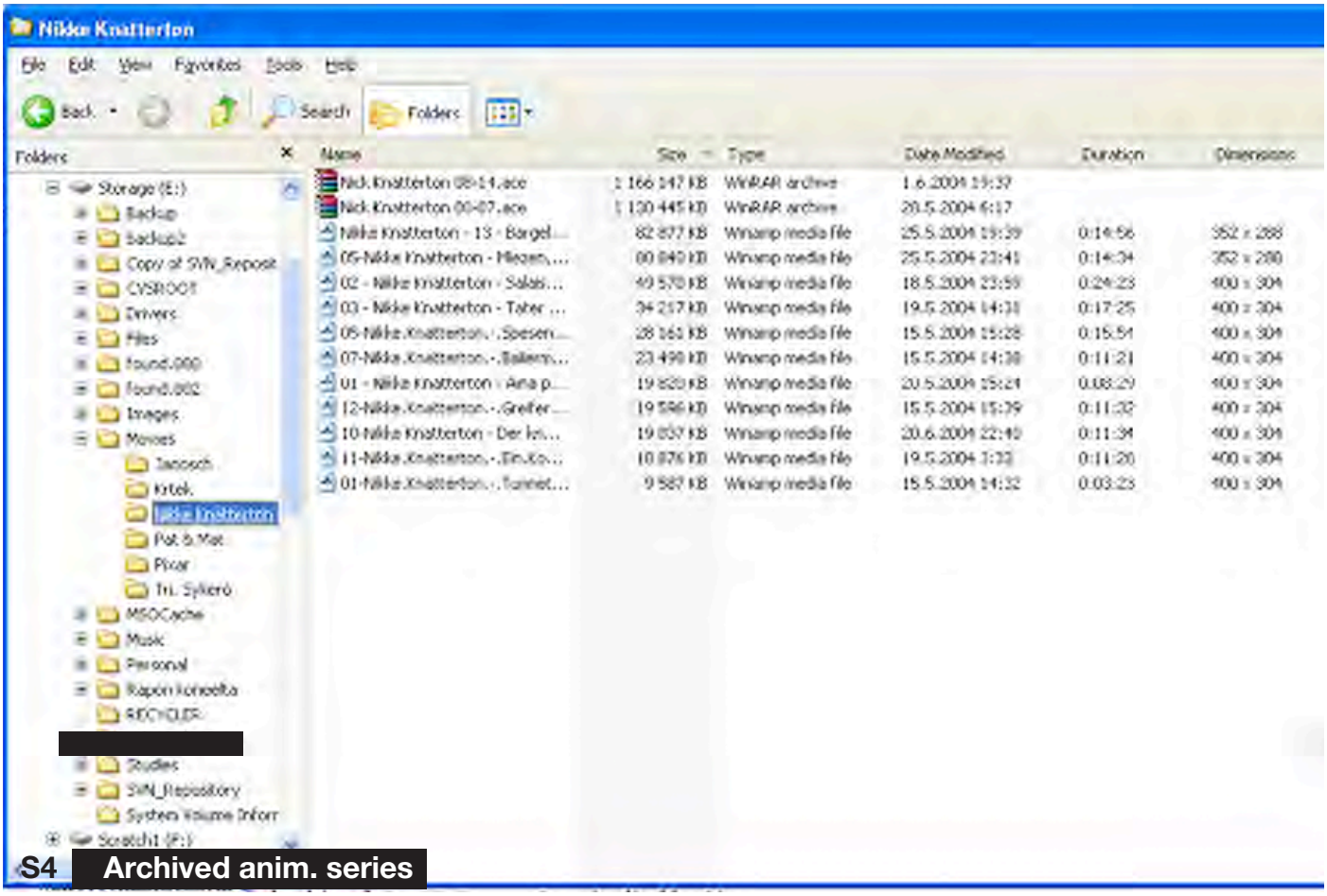
46 Recorded VHS tapes 1



47 Recorded VHS tapes 2

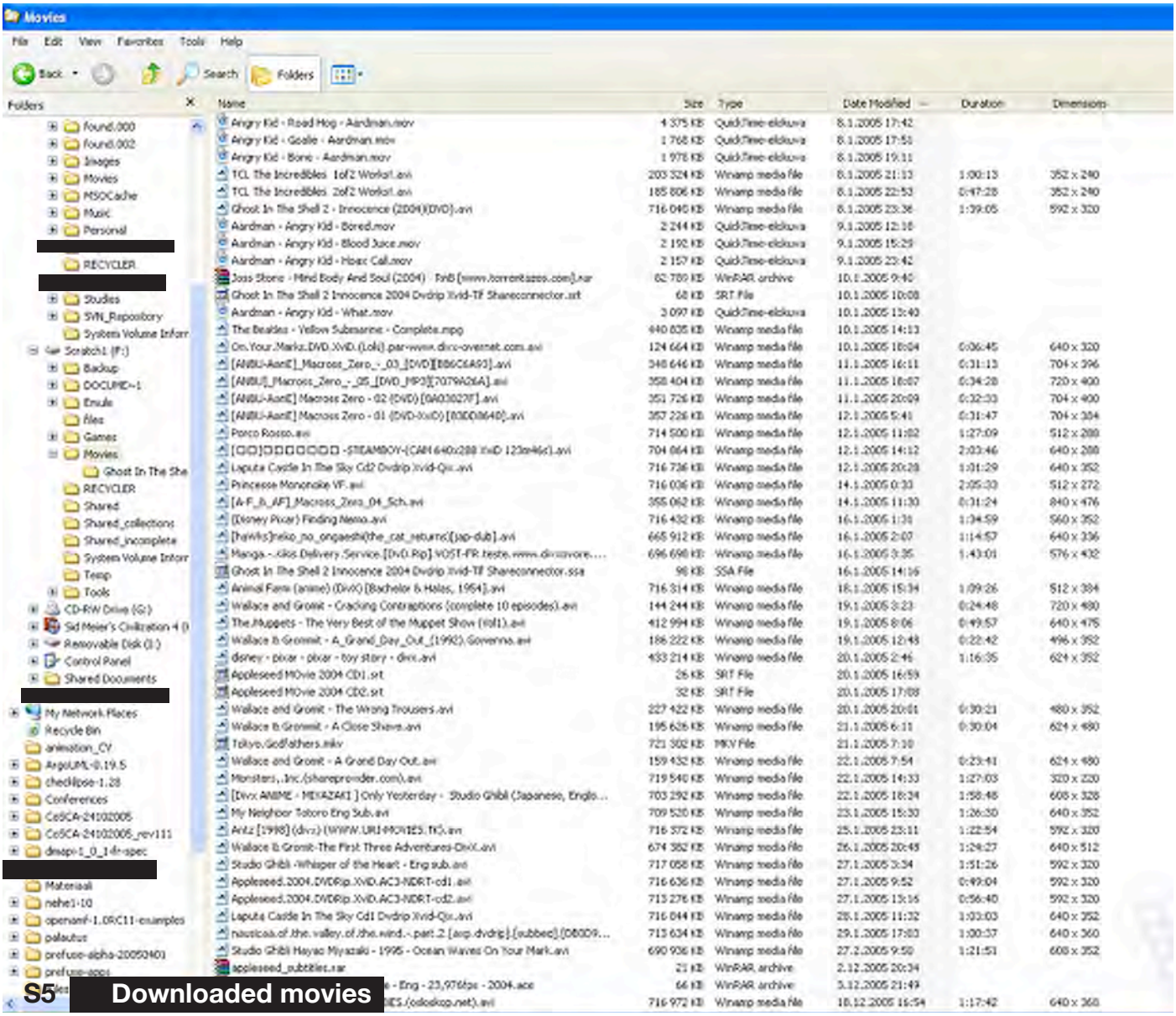
48 David Bowie VHS tape

49 8mm video tape



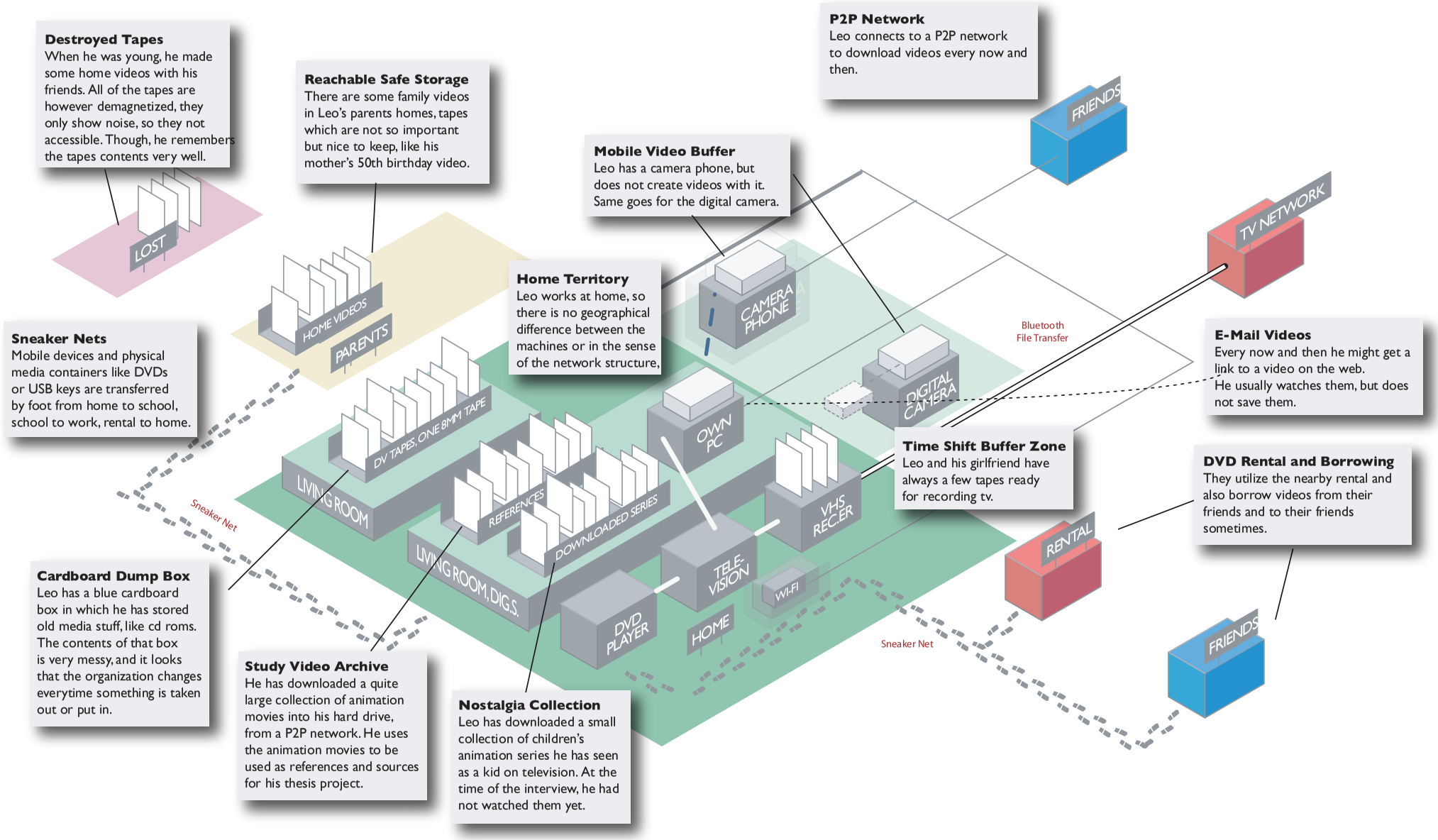
S4 Archived anim. series

Leo’s collection: Screenshots



S5 Downloaded movies

Leo's collection: Map



Theresa's collection: Summary

Theresa is a 29-year old student of landscape architecture. At the time of the interview she was living with her boyfriend in Lauttasaari, Helsinki.

BOOKSHELF of DVDs

Theresa and her boyfriend have a DVD player and a collection of DVDs along with some CDs stored in a bookshelf (50). The DVDs contain movies bought by her and her boyfriend. Some of the DVDs they have bought together, and some she has bought by herself (51-55). Her boyfriend has slightly more DVDs than she has in her collection (56).

BOX OF IMPORTANT STUFF

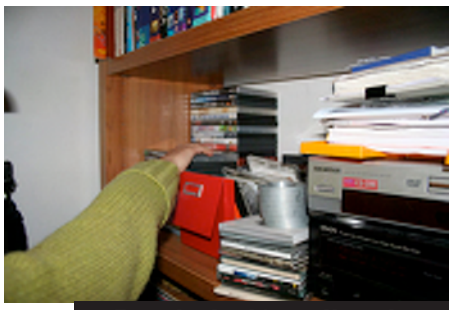
They have a box which contains a collection of important video tapes (57, 58). In the box there are master copies of her and her boyfriend's work projects. The tape in picture 59 has writing which tells what the tape is (59). There is a note about the screening event of the movie, attached to the cover of the tape (60). There is a self-made cover in one of the tapes (61).

BASEMENT, BAG OF TAPES

In the cellar, Theresa has a plastic bag full of VHS tapes (62). They don't have a VHS recorder any more, so they have stored some tapes that were considered important, in the basement. The tapes are in a plastic bag, amidst other important things like photos from her childhood (63). The tapes are stored in the bag in no specific order (64).

Theresa has collected a series of Walt Disney classics on VHS, but cannot watch them any more (65). The bag contains also a location scouting tape from one of her projects (66). The rest of the tapes are TV recordings she has done herself. On one tape there are the movies of Notting Hill and Modesty Blaise, other two contain episodes of the sitcom, Friends. There is a recording of Roman Polanski's Chinatown. One of the tapes contains Roger Rabbit and Fish Called Wanda. And then there is the horse movie Black Stallion, on which there is a number 52 (67). The number 52 refers to her family's video numbering system from her childhood. The set also contains a copy of a recording of her school dance from the year 1994 (68).

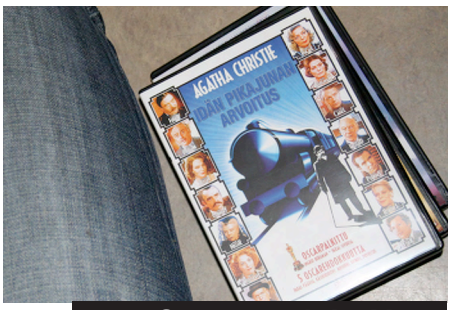
Theresa's collection: Photos



50 Bookshelf, collection

51 Abre los ojos, DVD

52 Commercial DVDs



53 Commercial DVDs

54 Commercial DVDs

55 Own DVDs

56 Boyfriend's DVDs

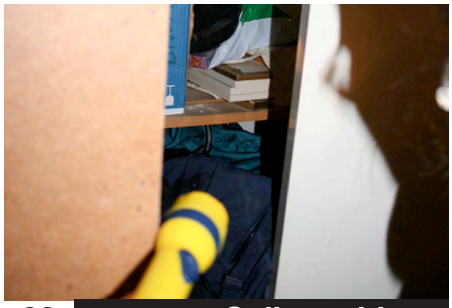
57 Box of importance

58 Important tapes

59 VHS tape with writing

60 Note attached to tape

61 Custom cover on tape

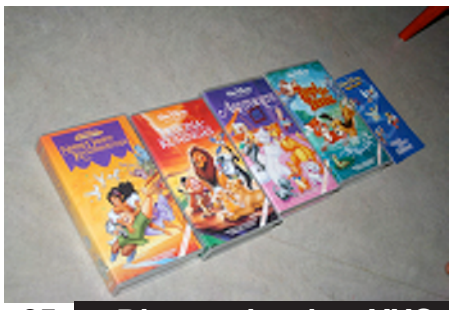


62 Cellar cabinet

63 Bag of tapes, cellar

64 VHS tapes in a bag

Theresa’s collection: Photos



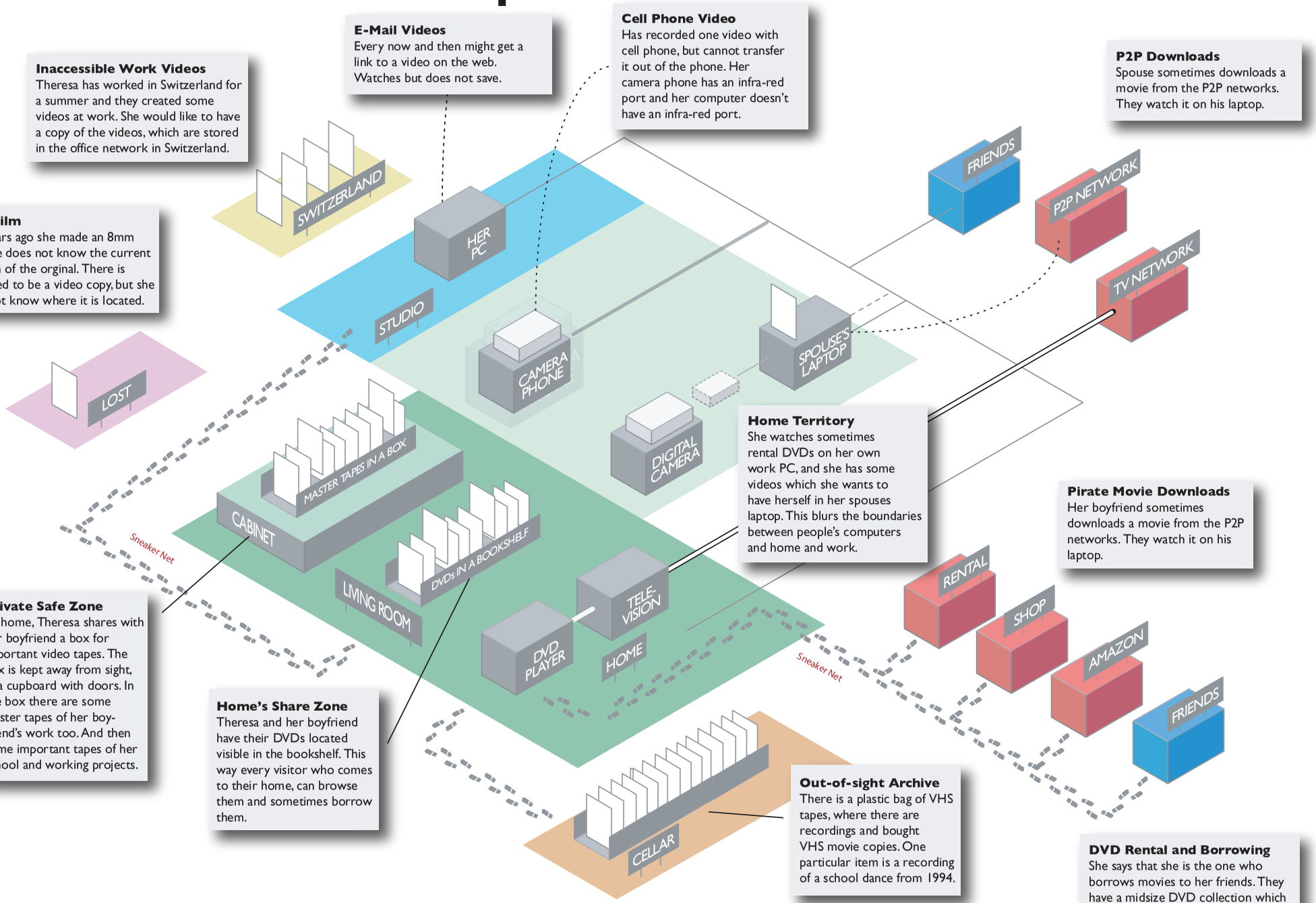
65 Disney classics, VHS

66 Working tape, project

67 Important VHS tapes

68 School dance, 1994

Theresa's collection: Map



Inaccessible Work Videos
Theresa has worked in Switzerland for a summer and they created some videos at work. She would like to have a copy of the videos, which are stored in the office network in Switzerland.

E-Mail Videos
Every now and then might get a link to a video on the web. Watches but does not save.

Cell Phone Video
Has recorded one video with cell phone, but cannot transfer it out of the phone. Her camera phone has an infra-red port and her computer doesn't have an infra-red port.

P2P Downloads
Spouse sometimes downloads a movie from the P2P networks. They watch it on his laptop.

Lost Film
Few years ago she made an 8mm film. She does not know the current location of the orginal. There is supposed to be a video copy, but she does not know where it is located.

Home Territory
She watches sometimes rental DVDs on her own work PC, and she has some videos which she wants to have herself in her spouses laptop. This blurs the boundaries between people's computers and home and work.

Pirate Movie Downloads
Her boyfriend sometimes downloads a movie from the P2P networks. They watch it on his laptop.

Private Safe Zone
At home, Theresa shares with her boyfriend a box for important video tapes. The box is kept away from sight, in a cupboard with doors. In the box there are some master tapes of her boyfriend's work too. And then some important tapes of her school and working projects.

Home's Share Zone
Theresa and her boyfriend have their DVDs located visible in the bookshelf. This way every visitor who comes to their home, can browse them and sometimes borrow them.

Out-of-sight Archive
There is a plastic bag of VHS tapes, where there are recordings and bought VHS movie copies. One particular item is a recording of a school dance from 1994.

DVD Rental and Borrowing
She says that she is the one who borrows movies to her friends. They have a midsize DVD collection which gets additions more or less frequently.

Mona's collection: Summary

Mona is a 30+ year old student and professional working in the audiovisual industry. In her case it is important to notice, that she doesn't have a computer at home or any other connected video device. At the time of the interview, she was living in a shared apartment with a couple as her room mates.

SHARED LIVING ROOM WITH TV AND VIDEOS

As Mona is living in a shared flat, they have a shared living room where they have a shared TV with a VHS and DVD player. They have a number of tapes on top of the VHS recorder which are marked but typically not very accurately (69, 71). This group of tapes they use for recording shows for time-shifting tv programs for a suitable watching period.

Next to the TV set and VHS player, they have a bookshelf which contains VHS tapes, both recorded and bought (70, 73). The tapes are organized so that the ones that are watched more rarely are placed in the backrow of the shelf (72). In the same bookshelf but on another shelf, there is a DVD collection, which contains classic movies and some personal favourites (74, 75). Some of the DVDs they have are stored on the living room table (76).

What is interesting in this set of movies, is that even if the tapes are all messed up, without clear indication of who owns which tape, they said that they know who owns which recorded VHS tape and how important that is to each one.

BEDROOM AND PERSONAL STUFF

Mona keeps some of her more important things in her bedroom. She has a bookshelf there which contains a VHS tape of a school project which is stored in-between books (77, 78). In the same bookshelf she also has one DVD, stored next to some other miscellaneous artefacts (79).

In the drawer of a desk, she keeps a collection of all kinds of digital backups. It has a copy of a presentation video, but stored in a data CD, in some unspecified video format (80). She also has some miniDV video tapes in the same drawer (85).

At the end of her bed, she keeps a tape collection which is turned into a bed side table (81). It holds a large number (approximately 50) of tapes as well as a few DVDs (84). There is a VHS tape marked RB, which for Mona, stands for the Martin Scorsese movie Raging Bull (82). She also has copies of some work project material which was given to her, and she never returened it (83).

SCHOOL & WORK CACHES

In her workplace, where she also has studied before, Mona has several small caches of video materials: two in separate locked cabinets, one on a desk and one on the school's server.

In the first locker she has little cardboard box, which is labeled "shooting tapes" (86). This box contains a set of tapes, some in miniDV format and also Hi-8 (87). In the same locker, she has another box, which contains VHS tapes and miniDV tapes (89). The VHS tapes have coded markings like 'SVVP 2' which only she is able to understand what they stand for (91). In the same locker she also keeps a collection of one project's master tapes, which are stored in DVCPro format (90).

Second cache she has, is on her office desk. On the desk she has a collections of project materials. One contains a set of miniDV tapes + data on DVD's (92). Another collection is a set of DVCAM and miniDV tapes (93). Yet another collection on the desk is a script of some study project along with the audio and video material (94). The desk also contains a set of external hard discs, which contain material from the same school project as the DVC pro masters (95).

In her third cache, Mona keeps another miscellanous collection of video material, stored on miniDVs, a VHS tape and even some Betacam SP master tapes (96-99). On another desk, she has a collection of video tapes and a presentation CD of the same project as the DVC Pro Masters were of (100).

DIGITAL STORAGE

She keeps video materials of a few school projects on the school server (101). The projects are available to her after authenticating with her school account.

Mona's collection: Photos

69 VHS tapes on recorder

70 VHS tapes in bookshelf

71 Untrue writing on tape

72 Backrow of tapes

73 VHS tapes

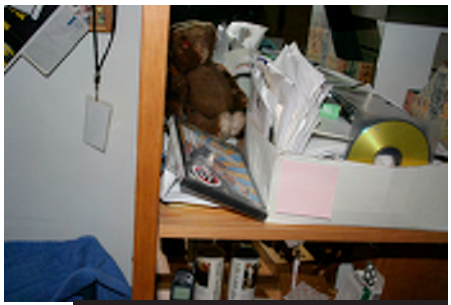
74 Classic DVD

75 Backrow of DVDs, stuff

76 DVDs on table

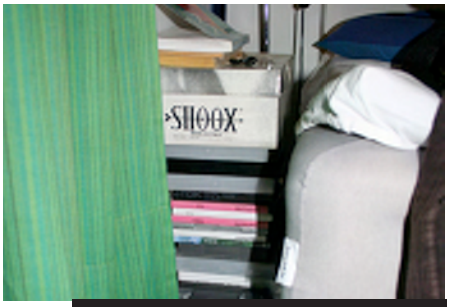
77 School project on VHS

78 Books and a VHS tape



79 DVD and other things

80 Presentation CD



81 VHS bed side table

82 Raging Bull VHS

83 Presentation video VHS

Mona's collection: Photos

84 VHS and DVDs

85 MiniDV tape in drawer

86 Tape dump box

87 Tapes of diff. formats

88 VHS tapes of project

89 Box, mixed media

90 DVCPro master tapes

91 VHS tapes

92 DV tapes, DVD-R discs

93 Worktapes, DV, DVcam

94 Project media

95 Hard discs, pending

96 Versions of project

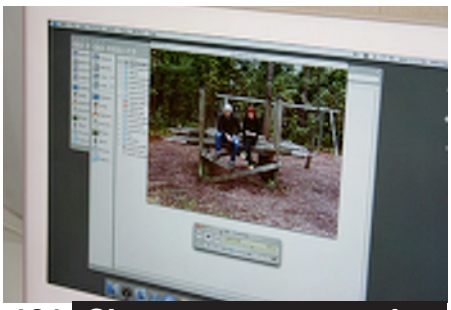
97 Presentation tape

98 Digital beta master

Mona’s collection: Photos

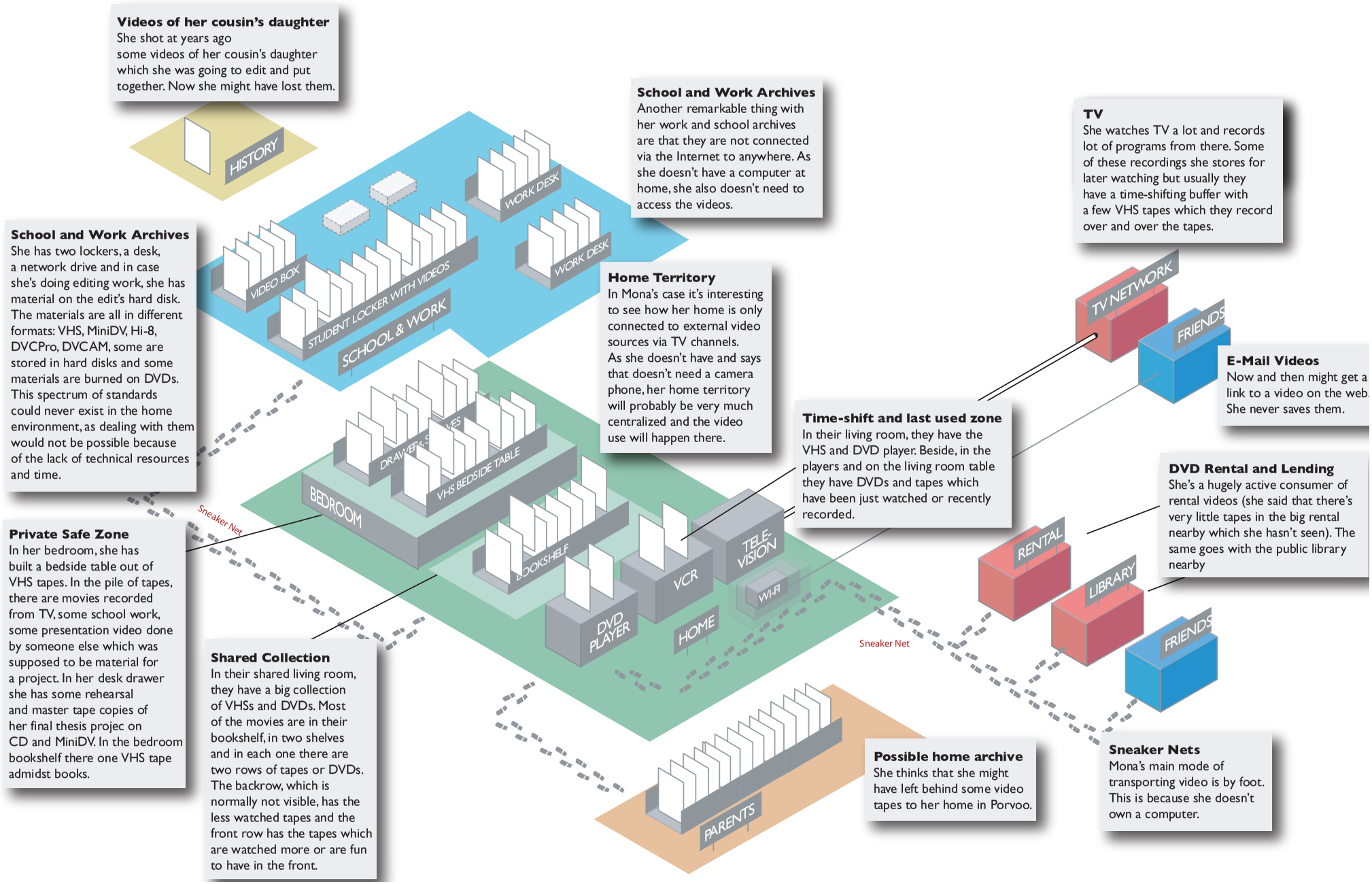
99 Practice, DVcam tape

100 Proximity of works



101 Short mov., vog codec

Mona's collection: Map



Videos of her cousin's daughter
She shot at years ago some videos of her cousin's daughter which she was going to edit and put together. Now she might have lost them.

School and Work Archives
She has two lockers, a desk, a network drive and in case she's doing editing work, she has material on the edit's hard disk. The materials are all in different formats: VHS, MiniDV, Hi-8, DVCPro, DVCAM, some are stored in hard disks and some materials are burned on DVDs. This spectrum of standards could never exist in the home environment, as dealing with them would not be possible because of the lack of technical resources and time.

Private Safe Zone
In her bedroom, she has built a bedside table out of VHS tapes. In the pile of tapes, there are movies recorded from TV, some school work, some presentation video done by someone else which was supposed to be material for a project. In her desk drawer she has some rehearsal and master tape copies of her final thesis projec on CD and MiniDV. In the bedroom bookshelf there one VHS tape admidst books.

Shared Collection
In their shared living room, they have a big collection of VHSs and DVDs. Most of the movies are in their bookshelf, in two shelves and in each one there are two rows of tapes or DVDs. The backrow, which is normally not visible, has the less watched tapes and the front row has the tapes which are watched more or are fun to have in the front.

School and Work Archives
Another remarkable thing with her work and school archives are that they are not connected via the Internet to anywhere. As she doesn't have a computer at home, she also doesn't need to access the videos.

Home Territory
In Mona's case it's interesting to see how her home is only connected to external video sources via TV channels. As she doesn't have and says that doesn't need a camera phone, her home territory will probably be very much centralized and the video use will happen there.

Time-shift and last used zone
In their living room, they have the VHS and DVD player. Beside, in the players and on the living room table they have DVDs and tapes which have been just watched or recently recorded.

TV
She watches TV a lot and records lot of programs from there. Some of these recordings she stores for later watching but usually they have a time-shifting buffer with a few VHS tapes which they record over and over the tapes.

E-Mail Videos
Now and then might get a link to a video on the web. She never saves them.

DVD Rental and Lending
She's a hugely active consumer of rental videos (she said that there's very little tapes in the big rental nearby which she hasn't seen). The same goes with the public library nearby

Possible home archive
She thinks that she might have left behind some video tapes to her home in Porvoo.

Sneaker Nets
Mona's main mode of transporting video is by foot. This is because she doesn't own a computer.

Thomas' collection: Summary

Thomas is a 30+ year-old interaction designer and university student from Japan. At the time of the interview he was living with his Finnish wife in Hakaniemi, Helsinki. They live in a fairly small apartment of 2 rooms and an integrated kitchen.

PERSONAL SETUP

They have a TV in their bedroom, with a DVD. Both of them have laptops. The other laptop contains a home video. They don't have any collections of commercial videos or DVD's. They use rental services to rent movies. As he is from Japan, they typically watch non-Finnish movies.

STRUCTURE OF COLLECTION

His home collection is stored in two safe places. There is a cabinet in which he and his wife have personal spaces as well as a shared space. (86) In his cabinet he keeps a Nokia cell phone and a cardboard box, which contains a number of miniDV tapes (87). The tapes have markings on them in Japanese as well as in English (91). The content of the tapes is important to Thomas. There is documentation and presentation material master tapes of his own projects, and the only copy of their wedding tape (88-90). He uses professional tapes to store the material so that he would not loose it.

BACKUP SOLUTIONS

Lately, Thomas has started creating an all-data backup collection on DVD's (92, 93). He makes a mark on the DV tape after he has made a back-up copy of it (91). The discs in the folder have also writings on them. He uses his memory to identify the data in them, and they have clear descriptions like "Architecture projects" on them.

As he is fairly dependant of the material he has, he stores it also to his school's server, which he knows, is backed up regularly. So he has all the important and critical stuff there too, just in case his stuff would be destroyed or ruined someway. In the school server he also has an indexed collection of example videos related to interaction design (Screenshot 6). This collection he keeps for demonstrative purposes. He dowloads work-related videos from the net and saves the video and the web page into a folder, so that it doesn't lose context (Screenshot 6).

Thomas' collection: Photos, screenshot

86 Personal cabinet

87 Cell phone box, tapes

88 MiniDV tapes from box

89 MiniDV tapes

90 MiniDV tapes

91 Tape with markings

92 Backup CDs and DVDs

93 Backup CDs and DVDs

S6 Archive, school server

Thomas' collection: Map